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LECTURE I.*

Delivered before the Royal College of Physicians of London on March 21st, 1922.

MR. PRESIDENT, FELLOWS, LADIES, AND GENTLEMEN.—In thanking you, Sir, for the honour which you have paid me by appointing me to deliver the Goulstonian Lectures, I am very sensible of my responsibility to maintain that standard which my predecessors have established. Unlike many of them, however, I cannot claim to submit to your notice any new or original material as the fruit of my own labours. It is the general experience and the painstaking investigations of many observers in the last decade that form the source of my lessons.

In conversation with many doctors, both those recently qualified and those engaged in practice for a number of years, I have often been struck by the lack of comprehension of those main principles of neurology essential for any accurate diagnosis of disease of the central nervous system—a gap in their knowledge the more remarkable when it is contrasted with the extensive and accurate appreciation of the symptoms and physical signs of disease of other regions of the body. This unhappy result can only arise from defective teaching on the one hand and lack of opportunity on the other. It is truly deplorable at the present time to find a man but recently qualified who, when confronted with a case of obvious disease of the central nervous system, can only mutter to himself a list of the cardinal symptoms of some three or four classical diseases, and on finding that the case in question does not fit into the picture of any of these has to confess with chagrin that he is completely baffled. What I am therefore attempting in these lectures is an epitome of the general principles of diagnosis and an interpretation of some of the more important and characteristic symptoms of disease of the central nervous system. And in the word "symptoms" I include also those signs of disturbed function which are to be elicited only by the observer. I am fully conscious that I am in no sense qualified to enlighten neurologists in their own province. My remarks are addressed rather to those whose opportunities for study in this particular branch of medicine are more limited and who perhaps have not been able to follow all the advances which neurology has made in recent years.

THE DISTURBANCE OF FUNCTION.

It has been pointed out by Head and others that every disease of the central nervous system manifests itself by disturbance of function. Hence the obvious absurdity of attempting to classify such diseases as either organic or functional. And since the central nervous system, with the exception of the optic nerve, is not accessible to the ordinary methods of inspection or palpation, we are inevitably thrown back upon the disturbance of function as the basis of our investigation. The first question which naturally arises is—What function or functions are disturbed? Consequently, our first endeavour must be to determine the physiological and anatomical situation of the disturbance. Of course, I am not denying that in some cases the pathological basis of the disturbance of function is not the first to strike the notice of the observer. But this immediate diagnosis proceeds from previously acquired knowledge of that particular disease and may be based, rightly based, too, on the history of symptoms afforded by the patient.

Our first question, then, is—What function is disturbed? Our second—What is the anatomical and physiological situation of this disturbance? For example, a patient has a useless arm—the power of voluntary movement is absent; we proceed by inquiry into the history, into the characters of the paralysis, the state of the reflexes and the other associated symptoms, if any, to determine at what level of the motor pathway between cerebral cortex and muscle nerve-ending the damage lies. Having established the physiological and, if possible, the exact anatomical diagnosis, the question of the pathological cause has to be settled. The answer to this part of the diagnosis is supplied by the history of the symptoms, our knowledge of the general pathology of the diseases which may affect the central nervous system, and in some cases by recourse to serological or bacteriological tests. All that I have said so far may appear the merest truisms, but nevertheless this conception lies at the root of all accurate diagnosis, and where a really difficult case is met its value will be appreciated.

VALUE OF HISTORY OF CASE IN DIAGNOSIS.

The statement is sometimes made that one physical sign is worth many symptoms. While this may be true in many cases, exception may fairly be made in disease of the central nervous system, where it is sometimes possible to make more than a shrewd guess at the nature of the disease solely by an investigation of the subjective symptoms experienced by the patient. Accurate and careful case-taking therefore assumes the greatest importance. Not only is the actual history of the onset of the symptoms, &c., of the greatest value, but careful inquiry into the details of many subjective symptoms will not infrequently provide more than a useful clue in the diagnosis. Students should be encouraged to enter fully into their case-histories, and such statements as "It is impossible to get a decent history," or "Patient complains of pain in the legs," are generally only a cloak for laziness or impatience. In a valuable contribution to the study of disseminated sclerosis, Birley and Dudgeon[1] have emphasised the importance of accurate history-taking. They point out how "the patient's description of the onset and character of the symptoms make it clear that widely separated areas of the central nervous system have been affected at the same or different times"—surely a most valuable help in diagnosis. They consider that "in a large majority of cases a diagnosis can be made on the history alone," and with this statement I am fully in agreement. The following case will serve to illustrate this point:—

A boy, aged 17, was admitted to hospital with the following history: Nine months previously, sudden weakness of the left arm and leg had been noticed while out walking; after three days these symptoms disappeared. About a week later the weakness of the left arm and leg returned and the movements of the left arm became very ataxic. This weakness again improved, so that at the end of a further seven or eight weeks he could walk well without a stick, and the trouble in the left arm had also improved very considerably. Shortly after this, some difficulty in the movements of the right arm appeared, and in the last three months before admission to hospital all the symptoms had become steadily worse again.

On examination he was found to present gross ataxia of the arms and some weakness of voluntary power in the legs; there was no nystagmus and no defect of speech. There was well-marked loss both in the arms and legs of those forms of sensation, the fibres subserving which travel in the spinal cord by way of the posterior columns—viz., the sense of position and passive movement, appreciation of the size, weight, and shape of objects, and the vibration sense. Both knee-jerks and both ankle-jerks were lost, while the plantar responses were extensor in type.

Loss of the knee-jerks and ankle-jerks is not very commonly found in disseminated sclerosis, and such a finding may well make one hesitate in making this diagnosis. Yet the

* Lectures II. and III. will be published in subsequent issues of THE LANCET.

history alone of this case rendered this diagnosis almost certain and the subsequent developments entirely confirmed this opinion, which was based in no small measure on the history supplied by the patient, for the picture presented later was one more or less typical of classical disseminated sclerosis, with tremors, a spastic paraplegia, and increased tendon reflexes.

The subjective sensations of the patient are of great diagnostic value in many other diseases of the central nervous system besides disseminated sclerosis. Buzzard,[2] for example, has drawn attention to the special characters of the so-called lightning pains of tabes dorsalis, and has pointed out how it is often possible to reach a diagnosis on this symptom alone. To this subject I shall return later. It is hardly necessary to emphasise the importance of a complete physical examination of the case. Mistakes are more often made from inadequate examination than from any other single cause. This examination should include not only the nervous system; it is essential that the other systems of the body should also receive careful attention, and no neurological examination is complete without the full general investigation which a case receives in the medical wards of a general hospital.

CONSIDERATION OF PARTICULAR SYMPTOMS.

Hitherto I have considered only what may be termed the general principles of diagnosis. I now wish to take some particular symptoms and attempt to interpret them in some of the various forms in which they may meet the observer. And the first symptom with which I would deal is pain—one common to many different diseases of the central nervous system.

Pain.

Trotter has discussed the whole subject of the physiology of pain in a luminous review. He points out what it is particularly valuable to bear in mind when dealing with cases where chronic pain is an urgent symptom, how "pain tends to become ingrained in the very substance of the nervous system." It is, as he suggests, a useful conception to regard pain as an exaggerated response by a physiologically irritated nerve.

How is pain produced by disease of the central nervous system? This question is a pertinent one, for leaving out of account the rare cases of so-called pain of central origin, we know that the grey and white matter of the central nervous system are insensitive to the ordinary forms of stimuli. The pain is chiefly produced in one of two ways, either by disease of the meninges themselves of the brain or spinal cord, or by some pathological process which can compress or stretch them, or by some lesion which directly irritates some part of the sensory afferent neurones in their course outside the spinal cord or brain and within the dural sheath. Such lesions are themselves usually of meningeal origin—e.g., chronic meningitis or a tumour growing from the meninges and involving sensory fibres—e.g., posterior roots. We are not here concerned with any form of dural disease. Pain of central origin excepted, all varieties of pain encountered in disease of the central nervous system fall into one of these two classes. Increase of tension either within the skull or the spinal canal is a common and potent cause of pain; clinically this form of pain is, of course, found much more commonly with intracranial disease, and is probably due to distension of the dural sac by the increase in the intracranial pressure. The relief afforded by a free opening of the dura mater is good evidence that this is the correct explanation. In a more restricted field the same is illustrated by the immense relief produced in some cases of pituitary tumour by the operation of sellar decompression, where the bony floor of the sella turcica is broken through and the tense dural envelope of the pituitary body incised. Now what are the characteristic features of the pain of increased intracranial tension? An accurate appreciation of its peculiarities is of the greatest value in diagnosis, when we consider how often it may be the sole or, at least, the principal symptom presented. It is in the first place generally paroxysmal, at least in the early stages of the disease, the paroxysms being often excited by any unusual form of exertion, by sudden changes of posture such as stooping; coughing or sneezing may also aggravate it. Mental activity also will not uncommonly precipitate a paroxysm of pain, for example, any prolonged reading or writing. In those cases where the pain is constant, it will generally be found that paroxysms also occur when the pain is greatly intensified. Such exacerbations may, of course, be accompanied by nausea or vomiting and other symptoms with which we are not immediately concerned here. The position of the pain is variable: at first, it may have a more or less close relation to the position of the lesion which is its cause, if this is a localised one—e.g., a tumour or an abscess—but more often this localisation is lacking. The frontal and the occipital regions are the parts of the head in which the pain is most commonly felt; in lesions of the posterior fossa of the skull it is, I think, true to say that the pain is, as a rule, first felt in the occipital region. But when the pain has persisted for long and occurs in severe paroxysms patients will usually say that the whole head aches intolerably. Actual descriptions of the patient's sensations vary, but the expression perhaps most often used is that the head feels "bursting." The pain does not generally have that throbbing character which is found in some other conditions, such as arterial hypertension. In the less severe cases the pain is characteristically relieved by rest in the recumbent position, and sometimes by the operation of lumbar puncture.

Before leaving this subject of pain in increased intracranial tension, I should like to draw attention to the significance of pain in the face in certain cases of intracranial tumour. Cadwalader[4] has emphasised this symptom in cases of tumour of the cerebello-pontine angle and certain rare cases where the Gasserian ganglion may be directly involved by a growth arising from the dura mater at the base of the skull. Such examples, however, of direct involvement of the fifth cranial nerve are not the only type of cases in which this pain in the face is encountered. It occurs not very infrequently as a quite early symptom in tumours of the pituitary body and when present is a valuable symptom. Leonard Mark[5] in his personal account of acromegaly has given an excellent description of what he calls his faceache, which he clearly distinguishes from his headaches. I have myself seen two cases of pituitary disease where this distinction between the pain in the head and the pain in the face was absolutely definite and was perfectly well appreciated and described by the patients. Other characteristic forms of pain to which I may refer are those found in lesions of the posterior nerve-roots and in cases of syphilis of the central nervous system, and notably in tabes dorsalis. MM. Déjerine and Gauchler[6] describe the pain of radiculitis as being either constant, or paroxysmal, or both; thus, there is often a continuous dull deep-seated pain, to which paroxysms are added, when the pain may radiate into the peripheral distribution of the spinal nerves. Pressure on the muscles or the peripheral nerves does not, as a rule, increase the pain, but an exacerbation may be characteristically produced by such acts as coughing or sneezing or changes of posture. In some cases, however, the pain may be produced by external stimuli. Riddoch,[7] for example, describes a case where a patient who was wounded in the lumbar region and in whom the posterior lumbar nerve-roots were involved, found that the pressure of his puttees was intolerable; he described the sensation as if coils and coils of red hot iron were wound round the legs. The extreme pain found in certain cases of injury of posterior nerve-roots is not always easy to distinguish from that described by Holmes[8] as being of central origin in some cases of wounds of the cervical part of the spinal cord.

Everyone is familiar with the so-called lightning pains of tabes dorsalis, and we are often content to leave their description at that. But in making an early diagnosis the exact character of the pain assumes great importance. Buzzard[2] has given a very good

description of these pains, and from my own experience I can confirm his observations, since I have lately been at particular pains to make careful inquiries into the matter. The pains of tabes dorsalis or of syphilitic disease of the central nervous system do not, as a rule, radiate in the long axis of the body or follow the course of the nerve distribution as has been so often taught. They tend to occur in bouts, which may last for several days or a week or more at a time; it is surprising how often patients will say that they come on with a change in the weather. Typically, the pain is described as stabbing or cutting, and as Buzzard[2] has pointed out, the sensation is one as if some sharp instrument were forced into the skin at a right angle to the long axis of the limb. Thus, one of my own patients said: "It's like someone screwing a corkscrew into my leg." Further, the actual area in which any one pain is felt is usually quite circumscribed. It is useful to bear the features of this kind of pain in mind. Recently, a case was referred to me for headache where it was thought that some ocular defect was present, but the ophthalmic surgeon could find none. As a matter of fact, the pain was not a headache at all, for on careful inquiry it was described as being "like a knife cutting the skin of the scalp" mostly in the area covered by the supra-orbital nerve; it occurred in paroxysms, each pain lasting only a few minutes. I diagnosed syphilis, an opinion which was fully confirmed by examination of the blood and the cerebro-spinal fluid, as well as by the results of treatment.

A brief reference to the interesting subject of pain of central origin will not be out of place at this point. Edinger's[9] well-known case, published in 1891, is really the first classical contribution to this subject. It was one exemplifying what is now known as the thalamic syndrome and in which severe and continuous pain in the paretic limbs accompanied by hyperæsthesia, were the dominating symptoms. So intractable was the suffering induced that the patient committed suicide. The lesion was a softening in the optic thalamus. Holmes[8] states that the most common cause of pain of central origin is disease of the lateral and posterior part of the optic thalamus. Certainly such cases are rare, though some disorder of what Head and Holmes[10] have termed affective sensation may be found in many cases of thalamic disease. In this connexion it is interesting to recall the pains of which many sufferers from paralysis agitans complain. It is true that many present signs of chronic arthritis, but in others one is sometimes tempted to assign the pain to a central lesion. Thus I may instance as an example the following case, and am indebted to the kindness of my colleague, Dr. F. L. Golla, for permission to mention it:—

> A man of 42, suffering from the symptom-complex of paralysis agitans and exhibiting the characteristic appearances of that disease, with especially marked general rigidity, has always complained since the onset of his symptoms of a constant vibration pain all over the body. This sensation he likens to that of an electric shock, only continuous, and the sensation is one more of extreme discomfort than of actual pain. There is no demonstrable loss of sensation anywhere in the body, and this abnormal sensation has persisted without relief by treatment. It is interesting to note that although the history is not absolutely conclusive, yet there is very strong reason to think that this symptom-complex has followed an attack of encephalitis lethargica.

Other examples of pain of central origin may be found in those rare cases of syringobulbia, which are sometimes characterised by very persistent pain, presumably due to interference with the sensory tracts in the fillet.

A still more interesting condition is that described also by Holmes[8] as pain of central origin apparently arising in disease of the cervical part of the spinal cord, and particularly in traumatic concussion changes in this part of the central nervous system. In some such cases it is, no doubt, difficult to exonerate a lesion of the posterior roots from blame as being the cause of the pain. But in some of Holmes's cases pain was referred to parts below the level of the wound, and in all his unilateral cases the spontaneous pains were limited to the paralysed side. A very severe case of such pains came under my notice during the war.

On May 17th, 1915, a young officer was blown up in the air by a high-explosive shell; after falling, a second shell exploded near him. There were immediate paralysis of both arms and both legs, and very severe pains in the hands and arms. There was retention of urine for three days only. The legs, which had been completely paralysed at first, very rapidly began to recover their power. When I examined him on June 1st, all voluntary power had returned to the legs, where no abnormal signs could be found except a double extensor plantar response and some diminution of the vibration sense. The most striking feature of the case however, was the very severe pain and hyperæsthesia in the hands and arms.

He lay perfectly still in bed with the arms motionless across the chest. On my first approach he said: "Whatever you do, don't sit on the bed or shake it." He complained of severe spontaneous pains in the hands and arms, especially along the ulnar aspects; these pains were greatly aggravated by any movement or by any sudden jarring of the body. There was no pain in the legs. The arms could be moved quite freely at the shoulders, but no movements were voluntarily performed at either the elbow- or wrist-joints, and I was unable to get him to move the fingers. Both hands were slightly swollen and œdematous, with some desquamation of the skin; no other signs of trophic lesions were found; no muscular atrophy was then present. There was no absolute loss of sensation, but on the ulnar aspects of both hands and forearms and in an area corresponding fairly closely to the eighth cervical and first dorsal segments a marked degree of hyperæsthesia was found; this was most marked to a light touch and much less to anything in the nature of a prick; indeed, the actual appreciation of pain in the shape of a firm and steady prick with a needle was definitely though only moderately diminished. The triceps- and supinator-jerks were not obtained; both knee-jerks and both ankle-jerks were brisk; there was no ankle-clonus; both plantar responses gave a feeble extensor response. The course of the case ran rapidly to recovery. Power gradually returned to the arms, but the pain and the hyperæsthesia persisted for a longer time, and even when there was practically no motor disability left, he still complained of a severe discomfort in the hands and arms. He wrote to me in September of the same year to say that for all practical purposes he was quite well, though he added that he still felt an aching in the arms when he tired.

We are, I think, justified in concluding that the lesion in this case must have been of the nature of a concussion of the cord at the lower part of the cervical enlargement, and I venture to suggest that the pain was a pain of central origin analogous to that found in lesions higher up in the sensory pathway—for example, in the optic thalamus.

It has been my endeavour to show how a study of the characters and distribution of the pain in disease of the central nervous system can help us not only to localise the site of the lesion, but also to elucidate the nature of the disease present. Obviously, we have to depend very largely on the coöperation of the patient. And this coöperation is sometimes difficult to achieve, especially in cases where any severe pain has existed for a long time. For it seems to be a very part of the nature of pain that the longer it exists and the more frequently it is experienced, the wider becomes its diffusion, as it were, and the less becomes the patient's resistance. Naturally, patients vary much in their powers of endurance, but even the most stolid or the most heroic among us cannot prevent the tendency for repeated attacks of pain or for continuous pain to produce their inevitable result. Hence the importance of going back to the earliest manifestations of this disturbance in our efforts to discover its correct interpretation, for these early symptoms are unclouded by the manifold impressions which are later superadded, impressions produced as the result of a perfectly natural process of auto-suggestion, an attempted explanation, in fact, by the patient of his own symptoms, partly in many cases by the suggestion of others, doctors as well as friends, and partly by that natural physiological tendency for the diffusion of painful sensations beyond the area where they were originally felt.

While pain is naturally the most urgent and the most frequent subjective symptom for which we are consulted, there are others which have an importance not always adequately realised. To such subjective symptoms the useful but ugly term paræsthesiæ is

generally applied. Now such abnormal sensations form a not inconsiderable part in the symptomatology of many diseases of the central nervous system, and if we are to make an early diagnosis it behoves us to pay due attention to any such manifestations as these. We may, if we like, call such symptoms functional, or, if we find no indubitable evidence of so-called organic disease we may say—the case is a functional one—but in doing so we must not be led into confusing this diagnosis with one of hysteria, unless we have other and more definite reasons for doing so. Increasing experience, however, will allow us to restrict more and more the number of cases where we are content with such a diagnosis.

OTHER SYMPTOMS.

I need not dwell on the facility with which such subjective symptoms as numbness, tinglings, formications, sensations of cold, a feeling of deadness of a limb, &c., are ascribed—and often quite correctly ascribed—to neuritis, whether this be a neuritis of a peripheral nerve or nerves, or a multiple neuritis of toxic origin. When such symptoms persist and yet no definite physical signs of disease are found, there is a strong temptation to ascribe them to hysteria. But when we consider how lesions of the central nervous system itself can be responsible for severe pains, we should be all the more ready to envisage the possibility of a central origin for these other subjective symptoms. And clinical experience fully bears out this hypothesis.

DISSEMINATED SCLEROSIS.

There are two diseases of the central nervous system—two above all others—in which an appreciation of the frequency and diagnostic value of these subjective symptoms is of the greatest importance. They are disseminated sclerosis and subacute combined degeneration of the spinal cord. And since the first is one of the commonest diseases of the central nervous system with which most practitioners are likely to meet, and the second is a disease which even now has hardly received that wide and full recognition it deserves, I may perhaps be excused for dwelling on a subject with which neurologists at any rate are already fully familiar. I have already quoted from Birley and Dudgeon's [1] recent contribution to the study of disseminated sclerosis and I will do so again. They give a table setting out the relative frequency with which certain signs and symptoms were found and this shows that the most common symptom was paræsthesia, present in 82·6 per cent. of the cases. Earlier writers have agreed on this point, for example, Russell [11] has emphasised its importance. The following case from my own experience will serve as an illustration:—

A lady of 35, of previously good health and in no sense of the words neurotic or hysterical, complained of sensations of cold in the face, throat, and arms. I saw her in March of a certain year; she gave the following history: In the previous January things had unaccountably dropped out of her hands, especially her right hand; there was no feeling in the fingers; there had been no pain and no definite muscular weakness; she had on one occasion actually burnt her fingers on a hot dish without feeling pain; her writing had become awkward and shaky owing to a difficulty in holding the pen. She experienced also a general feeling of unsteadiness in walking and was easily exhausted by any exertion.

On examination I could find absolutely no physical signs of any structural disease of the central nervous system. However, I strongly suspected that she was suffering from disseminated sclerosis. She began to improve slowly, but in June of the same year she had a sudden attack of blurred vision, accompanied by a feeling of great unsteadiness in the legs, so that she walked, as she said, like an intoxicated person. There was never actual diplopia, but her vision was so much affected that she could hardly see to write. Examination of the eyes at this time disclosed no abnormality. I saw her again in the following August and again was quite unable to find any definite signs, except that the abdominal reflexes could not be obtained, and that while on the previous occasion the plantar responses had been definitely flexor, this time no definite response was elicited.

Her symptoms again slowly retrogressed, and in December she reported herself as very much better, though she was still easily fatigued; occasionally she felt sensations of pins and needles in the arms, and found it tiring and rather difficult to use arms and eyes together in any coördinated work. Again no further physical signs were found.

Now it may be objected—What right have I to diagnose such a case as one of disseminated sclerosis? The answer is the accumulated experience of many observers who have been able to watch such cases develop and finally die with the characteristic pathological findings. Further, perhaps, it may be objected—Of what use to make such a diagnosis on such slender grounds when we have no adequate treatment to offer? In reality, of course, this is no objection, for the first step in any rational therapy is to recognise the morbid process as early as possible, and in this particular instance there are many observers working at this very problem, and we, as clinicians, must be ready to meet them when they are ready to meet us with definite conclusions as to the ætiology and treatment of this distressing disease. Moreover, up to now there are no diagnostic criteria, other than clinical, upon which we can rely.

SUBACUTE COMBINED DEGENERATION OF THE CORD.

Turning for a moment to subacute combined degeneration of the cord, we find a universal agreement that it is the subjective sensory disturbances that form the most common and the earliest symptoms. In a recent review of the subject, Hamilton and Nixon [12] state that changes in the nervous system occur in pernicious anæmia in from 75 to 80 per cent. of the cases, and when we remember further that in not a few cases the nervous symptoms precede the anæmia, we may understand how important is this appreciation of the early subjective disturbances. Perhaps I may be allowed to illustrate this point by reference to the following case.

A lady of 59 had complained for three years of abnormal sensations of numbness and tingling in the hands and feet. For nine months she had also noticed a peculiar sensation in the lower part of the chest and upper part of the abdominal wall as though she were encased in plaster-of-Paris or as though her corsets were too tight. During the last three months before she came under my observation she had noticed some difficulty in walking. On examination she was anæmic, with an enlarged spleen; she showed a slight degree of spastic paraplegia with exaggerated reflexes and a double extensor plantar response, an ataxia of the legs, and some loss of sensation in the peripheral parts of the arms and legs, especially of the senses of passive movement and posture. She was, in fact, a typical example of subacute combined degeneration of the spinal cord.

Now in this case the early manifestations of the disease in the shape of the subjective disorders of sensation had entirely escaped recognition, although they were quite characteristic and had been in existence for a long period. Much valuable time, therefore, had been lost in instituting appropriate treatment. It is obvious, therefore, that such subjective symptoms as these must always receive our closest attention.

There are, of course, many other conditions where abnormal subjective sensations form the earliest symptoms of the disease, notably in syphilis of the central nervous system and in some cases of cerebral tumour. Time, however, does not allow me to pursue this subject further. If I have succeeded in rousing any dormant interest in the study of such symptoms, this part of my task at any rate will not have been in vain.

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Report

ON AN

EXPERIMENTAL AND CLINICAL COMPARISON OF THE THERAPEUTIC PROPERTIES OF DIFFERENT PREPARATIONS OF 914 (NEOSALVARSAN).

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I. INTRODUCTORY. By H. H. DALE.

EARLY in 1915 the Medical Research Council were requested by the Board of Trade to undertake the biological testing of the different preparations corresponding to 606 (salvarsan) and 914 (neosalvarsan), which were to be offered for sale and for therapeutic use in this country. When 606 was first introduced, Ehrlich drew attention to the chemically uncontrollable variations in the toxicity of the product, and the necessity for testing every batch, to ensure absence of undue toxicity, before it was issued for use. Every batch of salvarsan made in Germany has, accordingly, from the first been tested at the Georg-Speyer Haus, in Frankfurt, before its issue. There is no evidence that the same practice has been adopted in the case of neosalvarsan; the pamphlet accompanying each package of this product contains no indication of the performance of a biological test, such as is described in detail in the pamphlet accompanying each ampoule of salvarsan. In the case of neither product is there any indication of a control for therapeutic efficacy; the control described is purely for freedom from undue toxicity, and that only in the case of the older 606. This relatively simple procedure may have been adequate in the circumstances of production in Germany, where the whole supply of both preparations has been made in one factory, working in close touch with the inventors.

The Problem in England.

The problem presented in this country was somewhat different. The directions for making 606 were fairly complete in the patent specifications, and the only task before the manufacturers concerned was to find those precise working details, of the somewhat complicated and uncertain process, which would give, with reasonable uniformity, a product corresponding not only in chemical composition, but in physical properties with the original salvarsan, and having no greater direct toxicity than this preparation, as revealed by tests on animals. This was achieved by several manufacturers, and a satisfactory supply of 606 was obtained, was supplied throughout the war, and is still available.

The position was not so clear in the case of 914. The details given in the patent specification are not adequate, and the composition of the product differs widely from that suggested by the theoretical formula. A substance corresponding to this formula would contain much more arsenic than the neosalvarsan to which the clinical worker was accustomed, and could not safely be supplied for use in the same dosage. Each manufacturer, therefore, had to supplement by his own ingenuity the imperfect information available, in the endeavour to make a product which could safely and adequately replace the familiar neosalvarsan. In these circumstances it did not seem justifiable to follow what was, apparently, the German practice with regard to neosalvarsan, and allow these substitutes to be issued without biological control. A new basis of testing had, therefore, to be formulated, founded not upon any existing German precedent, but upon what could be discovered from the literature and from actual tests of such samples of the original preparation as could be obtained. After a preliminary experimental period, which was prolonged by various conditions then existing, the basis was adopted on which products of this type have now long been and still are regularly tested. It was decided that only such batches should be allowed to be issued for therapeutic use as were tolerated by mice, on intravenous injection, in a dose of 0·3 mg. per gramme of body-weight. Each batch is tested on five mice in this dose, and if more than one mouse dies, or if definite bad symptoms are produced, the batch is rejected. Recent experience with an adequate series of batches of German neosalvarsan shows that the dose had been correctly chosen for the limit of tolerance for this product; nearly every batch of original neosalvarsan which has thus been tested will pass the test on the dose of 0·3 mg. per gramme of mouse, but all would fail if the dose were raised to 0·4 mg. per gramme.

Two Distinct Classes of Neosalvarsan Type.

A short experience with the application of this test sufficed to indicate that the preparations of the neosalvarsan type submitted for test fell into two well-marked classes. On the one hand were those which resembled the German product more or less closely in appearance, in solubility, and in the rapidity with which their solutions underwent decomposition if left standing exposed to the air. On the other hand, there were others which had an advantage over the German product in their extremely free and rapid solubility, and which gave evidence of much greater stability in solution. Preparations of the former class had a border-line toxicity from the point of view of the test; many samples just passed it, and many others failed. A slight raising of the standard would have excluded nearly all. Those of the latter class—the freely and immediately soluble type—passed the routine test with an almost unbroken regularity; when, experimentally, sample batches of this type were tested on higher doses, it was found that many were tolerated in a dose of 0·5 mg., some even in a dose of 0·6 mg. per gramme; i.e., the toxicity was often only one-half of that at which they would still have passed the official control.

No question of a control of therapeutic efficacy arose at this time. It would have been impossible, in any case, to carry it out with the staff available under war conditions. From the clinical side there was no hint of dissatisfaction; here again, in the hurry to get men through their treatment and return them to duty, no adequate control of results was possible. The practitioner appreciated the additional convenience afforded by rapid and perfect solubility, and the freedom from constitutional reactions, even when highly concentrated solutions were injected. The demand for the more soluble and less toxic type of product grew very rapidly, until manufacturers whose endeavour had been rather to copy the German product found themselves forced to modify their process, so as to produce a more soluble type. Therewith the toxicity of their products fell likewise to the lower level. When, under peace-time conditions, it became possible to follow more thoroughly the effects of treatment, it was reported from several sources to the Salvarsan Committee (appointed meanwhile by the Medical Research Council) that the curative action of the 914 products in use, which by that time had almost entirely conformed to the more soluble and stable type, was under serious suspicion of being inadequate. An investigation was therefore undertaken by those charged by the Medical Research Council with the duty of testing these remedies. They were able to use, with slight modifications, the method, then recently recommended by American workers, of evaluating the therapeutic power on mice infected with a strain of trypanosomes. They found

indications of a pronounced inferiority in therapeutic action of the 914 products of this country, as compared with the original German product, or with the former output of some British manufacturers. The facts were fully presented to the manufacturers concerned; the latter, with their experience, were then able to produce preparations which, while retaining some of the advantages of rapid solubility, showed as good therapeutic qualities as the German preparation, according to the experimental indication, and still satisfied the official control as regards toxicity. These are the British products of the 914 type which are now being supplied.

The Need for Official Control of Products of the 914 Type.

The result of this investigation made obvious the desirability of imposing, if possible, an official control of products of the 914 type for therapeutic potency, in addition to the existing one for absence of abnormal toxicity. The existence of the latter alone, in the case of a substance of ill-defined composition, such as 914, tempted the manufacturer to secure a smooth passage for his product, by slight changes in the process, which gave it regularly a lower toxicity than that which the test allowed. It was clearly desirable to make certain that, in so doing, he was not weakening its therapeutic action. Before steps in this direction could be considered, however, it was necessary to ascertain whether the difference in efficacy of different samples in removing trypanosomes from the peripheral circulation in mice corresponded with a clearly recognisable difference in their efficacy in removing the spironemes from syphilitic lesions in the human patient. The following sections of this paper describe the details of the investigation, in which the same representative samples of the different types of product were compared both experimentally and clinically. It will be seen that, so far as the clinical observations permit conclusions as to relative therapeutic efficacy in syphilis, the results of the clinical trial are in full accord with the experimental estimates.

The experimental work detailed in the following section has been carried out by Dr. Burn, Miss Durham, and Miss Marchal; the clinical observations were made at the Rochester Row Military Hospital by Major White and Mr. Mills.

II. EXPERIMENTAL RESULTS.

By J. H. BURN, F. M. DURHAM, and J. E. MARCHAL.

The experimental method used for estimation of the relative therapeutic value of different preparations of 914 is a modification of that recently described by Voegtlin and Smith (1920).[1] These workers determined the least dose of a preparation requisite to produce a certain effect on rats in which trypanosomiasis is developing. By counting the number of organisms per c.mm. in the tail blood of infected rats, Voegtlin and Smith were able to select animals suffering from the disease to the same extent, and were then able to compare the effect of different doses of the curative preparation. In our experiments the first results were obtained by the use of rats infected with *Trypanosoma rhodesiense*, and we observed, as did Voegtlin and Smith, the effect of a dose of 914 on the number of trypanosomes in the peripheral blood at the end of 24 hours. Our supply of rats ran short, however, and, as we were accustomed to use mice for the biological test for the toxicity of samples of 914, we determined to attempt to carry out the therapeutic test also on mice. About the same time, through the kindness of Prof. Mesnil of the Pasteur Institute, we obtained a strain of *T. equiperdum*, and we infected mice with this species. We found mice much more convenient than rats for the therapeutic test; they were much easier to handle, and the procedure of intravenous injection into a large number of animals was much less exhausting. We made a further departure from the details described by Voegtlin and Smith in observing the effect of the curative dose until 72 hours had elapsed from the injection, for we found this to be a more suitable end-point than the shorter period of 24 hours. While the bulk of our work has been carried out on mice infected with *T. equiperdum*, observing the curative effect for a period of three days, it should be stated that we obtained closely similar results, using rats infected with *T. rhodesiense* and observing the therapeutic effect only for 24 hours.

It will be sufficient to outline our precedure in the case of the experiments with mice infected with *T. equiperdum*. When the strain of this organism was first received, it was transferred to rats and passed through several animals of this species in order that a constant virulence might be obtained. The strain has been transferred from rat to rat ever since, and when we desired to carry out a therapeutic test, mice were infected from the blood of a rat by injecting into them intraperitoneally 0·1 c.cm. of an emulsion of the infected rat's blood in 1 per cent. citrate saline, such that the total number of trypanosomes received by the mouse was in the neighbourhood of 7–8 millions.

Method of Experiment.

For one experiment, as a rule, 30 mice were infected in this way, and two days later an attempt was made to select from the 30 mice those in which the infection had progressed to a sufficiently uniform stage. This was done by pricking the tail of each mouse and drawing up a drop of blood into a hæmacytometer pipette exactly as in carrying out a red-cell count. As a diluent, Toison's fluid was used, to which a little formalin had been added. When the blood had been thoroughly mixed with the stain, a drop from the pipette was transferred to the counting chamber in the usual way, and after being covered with a cover-slip was allowed to stand for five minutes in order that the organisms present might settle down on to the floor of the chamber. These were seen, under the 1/6th mm. objective, to be sharply fixed and stained, so that their enumeration was as easy as that of the leucocytes. In our experience two days after infection, out of 30 mice about 20 contained trypanosomes in the peripheral blood in numbers varying from 100,000 to 500,000 per c.mm. Voegtlin and Smith found that in rats, for the purpose of comparing the therapeutic effect of doses of different sizes, animals whose blood contained 100,000 to 300,000 organisms per c.mm. could be regarded as being at a uniform stage of infection. A series of determinations showed us that in mice a dose producing a certain degree of curative action on animals containing 100,000 trypanosomes per c.mm. could exert the same effect on those containing as many as 500,000 per c.mm., but not on those in which trypanosomiasis had developed further, unless the dose were relatively large. Mice, in which the number of organisms lay within the limits 100,000 to 500,000 per c.mm., have, therefore, been regarded as infected to a "standard" extent, and the use of mice with slightly larger numbers of organisms has been limited to the study of the effect of doses considerably greater than what we describe as the minimal curative dose.

The various samples of 914 preparations examined have in every case been administered intravenously, a procedure very simple to carry out in mice by injection into one of the tail veins. The effect of the injection has been observed by microscopic examination for the presence of trypanosomes in drops of blood taken from the tail and examined fresh under 1/6th mm. objective. Such examinations of the blood were made 24, 48, and 72 hours after the injection of the drug. A certain convention was adopted in recording the results of the examination. In the fresh, living condition, trypanosomes are very easily detected, on account of the disturbance of red corpuscles due to their lashing movements. If systematic search through a drop of the fresh blood failed to reveal the presence of any trypanosomes, the result was recorded as "nil." This does not

[1] C. Voegtlin and H. Smith: Journ. Pharm. Exper. Ther.' 1920, xv., 175.

mean that we supposed that the animal had been rendered perfectly free from trypanosomes; but, as a matter of practical observation, we found that, at the end of 72 hours, the trypanosomes were either so abundant that they were readily found in a drop of blood, or so scarce that none were found. In the former case, the infection always showed a rapid re-acceleration of its progress, and the animal died

TABLE I.—*Experimental Examination of Sample C1 of British Manufacture.*

(A) = Mouse.
(B) = Size of infection before injection, in thousands per c.mm.
(C) = Dose of C1 calculated in mg. per g.
(D) = No. of trypanosomes present in peripheral blood after periods of hours.

(A)	(B)	(C)	(D) 24 hrs.	(D) 48 hrs.	(D) 72 hrs.	(A)	(B)	(C)	(D) 24 hrs.	(D) 48 hrs.	(D) 72 hrs.
1	644	0·09	0	0	0	15	112	0·05	††††	††	0
2	440	,,	0	0	0	16	272	,,	††††	D.	
						17	250	,,	†	0	0
3	884	0·08	0	0	0	18	238	,,	††	0	0
4	846	,,	0	0	0	19	360	,,	†††	0	0
5	340	,,	†††	0	0	20	320	,,	††††	D.	
6	300	,,	0	0	0						
7	488	0·07	0	0	0	21	323	0·04	††††	††††	D.
8	440	,,	†	0	0	22	328	,,	††††	††††	D.
9	300	,,	0	0	0	23	294	,,	††††	††	D.
10	236	,,	††	0	0	24	270	,,	††††	D.	
11	214	0·06	††	0	0						
12	160	,,	0	0	0	25	194	0·03	††††	†††	D.
13	300	,,	†	0	0	26	126	,,	††††	††††	D.
14	256	,,	†	0	0						

D = dead.

within the next two days. In the latter case, the trypanosomes were not discovered by the routine examination of one drop of blood for several days afterwards, and were usually not found for upwards of a week, the animal living for a fortnight or more longer. Although, therefore, the finding "nil" does not represent an absolute cure, it does represent a sharply differentiated and easily recognised degree of therapeutic action. It was not difficult to determine the minimum dose which would regularly produce this effect. Throughout this investigation, the dose, determined for each preparation, has been the least dose which caused, within 72 hours, a disappearance,

TABLE III.—*First Comparison of British and German 914 Products.*

(P) = Preparation. (Mi.) = Minimal curative dose.
(Ma.) = Maximum tolerated dose.
(RD) = Ratio of curative dose to tolerated dose.

(P)	(Mi.)	(Ma.)	(RD)	(P)	(Mi.)	(Ma.)	(RD)
German				British			
A1	0·02	0·3	1 : 15	C1	0·06	0·5	1 : 8
A2	0·02	0·3	1 : 15	C2	0·03	0·5	1 : 16
A3	0·02	0·3	1 : 15	C4	0·05	0·5	1 : 10
British				C5	0·04	0·3	1 : 7·5
B1	0·04	0·4	1 : 10	C6	0·04	0·4	1 : 10
B2	0·05	0·3	1 : 6				

complete in the above sense, of trypanosomes from the tail blood of a mouse with a standard injection. Such a dose has been termed the minimal curative dose.

Description of Tables.

We may first give in full detail the results of the examination by this method of two preparations, one of which is the German product, and the other a preparation of different make, purporting also to be 914, but showing a marked inferiority in therapeutic value when examined by the test. Each table is a compilation of data obtained in three experiments on three sets of infected mice. The second column in the tables gives the number of trypanosomes in each c.mm. of the tail blood of the mouse, which was found shortly before the injection was made. The third column expresses the dose administered in terms of mg. per gramme of body-weight; while, so far as possible, mice were chosen of 20 grammes weight, the dose was always calculated so as to be proportional to their exact weight (to the nearest gramme). The last three columns give the result of the examination of a drop of fresh blood at the stated intervals after the injection. Roughly, the result recorded as †††† means that trypanosomes were present in the tail blood in numbers exceeding 500,000 per c.mm.;

TABLE II.—*Examination of Sample A1, which was Current Neosalvarsan of German Manufacture.*

(E) = Mouse.
(F) = Size of infection before injection, in thousands per c.mm.
(G) = Dose of A1 in mg. per g.
(H) = No. of trypanosomes present in blood at a period (hours) after injection.

(E)	(F)	(G)	(H) 24 hrs.	(H) 48 hrs.	(H) 72 hrs.	(E)	(F)	(G)	(H) 24 hrs.	(H) 48 hrs.	(H) 72 hrs.
1	436	0·06	0	0	0	12	178	0·02	0	0	0
2	422	,,	0	0	0	13	177	,,	†	0	0
3	400	0·05	0	0	0	14	178	0·015	†	0	0
4	396	,,	0	0	0	15	170	,,	††	0	0
						16	674	,,	††††	††††	D.
5	340	0·04	0	0	0	17	556	,,	††††	D.	
6	280	,,	0	0	0						
7	220	,,	0	0	0	18	536	0·0125	††††	D.	
						19	520	,,	††††	††††	D.
8	248	0·03	0	0	0						
9	196	,,	†	0	0	20	423	0·01	††††	D.	
						21	404	,,	††††	D.	
10	120	0·025	†	0	0	23	12	,,	††††	D.	
11	104	,,	0	0	0	24	100	,,	†	0	0

D = dead.

††† indicates numbers from 100,000 to 500,000, and †† means an infection lying between 10,000 and 100,000; finally, † is used for less than 10,000 per c.mm.

The result set out in Table I. of the examination of preparation C1, which was manufactured in this country, is seen to be that a dose of 0·06 mg. per g. removed all trypanosomes from the tail blood of each of the four mice in 48 hours, while, on the other hand, in 72 hours all mice receiving a dose of 0·04 mg. per g. were dead. The effect of a dose of 0·05 mg. per g. was intermediate. We take the figure 0·06 mg. per g. for preparation C1 and consider it to represent the "minimal curative dose," this being the least dose which removed trypanosomes from the blood of all mice within 72 hours.

TABLE IV.—*Comparison of the German Product with the New British Products supplied to us by the Manufacturers after the existing inferiority had been pointed out to them.*

(P)		(Mi.)	(Ma.)	(RD)
A3	German	0·02	0·3	1 : 15
B3	British	0·015	0·3	1 : 20
C3	,,	0·02	0·3	1 : 15

In Table II. are given the results of preparation A1, which is a sample of the current neosalvarsan of German manufacture. In this table it is seen that for A1 the least dose which is able to cause the disappearance of trypanosomes from all mice in 72 hours is 0·02 mg. per g.

In this way an examination of several 914 products was undertaken, several samples of each make being tested. Table III. sets out the results of this examination; in the second column it will be seen that the figure for the minimal curative dose of the German preparations is, in the case of each of the samples tested, 0·02 mg. per g. The figures for the other preparations are, with one exception, twice to three times as great, indicating an obvious inferiority in therapeutic value.

The third column of Table III. gives the "maximum tolerated dose" for the corresponding preparation. This, as mentioned earlier, is the largest dose which can be injected intravenously into each of five normal mice without causing death in more than one

of them, and it forms an expression of the toxicity of the preparation. A comparison of the minimal curative dose with the maximum tolerated dose, such as is presented in the last column of Table III., shows that, as a rule, though not invariably, a fall in curative value is accompanied by a proportionally smaller fall in toxicity, but there is no close correspondence between the two indices.

We may now draw attention to the results obtained by carrying out the therapeutic test on preparations furnished by British manufacturers after they were informed of the results already detailed. The results appear in Table IV. In the second column of the table the minimal curative dose of each preparation B3 and C3 is seen to be practically identical with that of the current German neosalvarsan, the figure for B3 indicating a slightly greater therapeutic value than that for A3.

Finally we wish to state briefly that we have not discovered any differences by this method between the therapeutic value of different makes of 606, whether British or German. All give uniformly the value of 0·01 mg. per g. for the minimal curative dose, which may be compared with the figure 0·02 mg. per g. for the best 914 preparations recorded above.

Six of the samples of 914 preparations experimentally tested were then chosen for a clinical comparison, the report of which is given in the next section. These samples are referred to in Tables III. and IV. as A2, A3, C2, C3, and B2, B3.

It will be seen by reference to these tables that A2 and A3 are current samples of the German neosalvarsan. B2 and C2 are samples of British manufacture, taken from the period before the suggestion of defective therapeutic properties was raised. According to the experimental indications, as shown in the tables, B2 was seriously defective in therapeutic power, having only about two-fifths of the activity of the German samples, whereas C2 was chosen as being a particularly active sample of the British product at that period, its activity being, apparently, about two-thirds of that of the German product, as judged by the experimental test on trypanosome infection in mice. B3 and C3 are samples from the same two British sources as B2 and C2, but taken after the methods of manufacture had undergone modification, in accordance with the above indications. B3, it will be seen, is experimentally rather better than, and C3 approximately equal to, A2 and A3 in therapeutic activity.

III. CLINICAL RESULTS.

By C. H. MILLS and C. F. WHITE.

FROM THE MILITARY HOSPITAL, ROCHESTER ROW, S.W.

In view of the growing opinion which we have shared with other clinicians that the recent endeavours on the part of the manufacturers to lessen the toxicity of the newer 914 preparations had to some extent also lessened their therapeutic properties, we readily complied with Dr. Dale's suggestion in carrying out these investigations in syphilitic patients, concurrently with a parallel series of experiments conducted in his department, in which the same preparations of 914 were used in mice infected with *T. equiperdum*.

No experimental work hitherto carried out has been of sufficient inportance to prove, or disprove, that the results obtained in treating trypanosome-infected mice with arsenobenzol form a true indication of the spirochæticidal value of such drugs in syphilitic patients. Opinion has leaned towards the assumption that no reliable comparison could be drawn between the results so obtained when dealing with different organisms in such different soils. We fully recognise that the number of cases employed is small, but we have taken the view that the results obtained in a very thorough investigation upon a few cases are usually of more scientific value than those obtained in a larger total under a less rigid scrutiny. Again, a very obvious source of error is the varying degree in which the different individual syphilitic lesions —even in the same patient—are affected by an intravenous injection of an arsenobenzol preparation. The main factors in such variation are probably the rate and amount of penetration of the derivative of the drug into such lesions. One would arrive at a very inaccurate deduction in comparing the effect produced upon spirochætes protected in the depth of a densely indurated and avascular chancre, on the one hand, with that produced on spirochætes in an early, superficial, vascular and therefore more permeable lesion, on the other. With this in view, an endeavour has been made, in the majority of primary cases, to select only those in which the characteristics of the chancre most nearly approached a clinical uniformity.

In our series of syphilitic patients (Table V.) cases were chosen presenting readily accessible surface lesions, and in every instance the *S. pallida* was

TABLE V.

(1) Preparations A2 and A3 (0·45 g. injected intravenously); current German samples. Minimal curative dose for mice 0·02 mg. per g. (high activity).

Case No.	Syphilis present: duration in weeks.	*S. pallida* detected on dark-ground examination: hours after first injection.		
		18–20.	48.	72.
1	Primary, 4–5. S.P., chancre coronal sulcus.	0	0	0
2	Primary, 4–6. S.P., chancre coronal sulcus.	0	0	0
3	Secondary (clinical relapse) after 914. S.P., papule anus.	0	0	0
4	Primary advanced, plus gonorrhœa, 4–5. S.P., chancre frænum.	0	0	0
5	Secondary (clinical relapse). S.P., fissure prepuce.	0	0	0
6	Primary, 4–6. S.P., meatal sore.	0	0	0
7	Secondary, 26 (approx.). Condylomata.	Present	Present	Present
8	Primary advanced, 4–5. S.P., chancre prepuce.	0	0	0
9	Primary, 4. S.P., abundant chancre coronal sulcus.	0	0	0
10	Secondary, 7–8. S.P., chancre frænum.	0	0	(?)*

Preparation, Cases 1 to 4: A2. Cases 5 to 10: A3.
S.P. = *S. pallida*. * Patient not available; in detention.

Remarks.—In only one case out of 10 could *S. pallida* be detected in 18–20 hours after an intravenous injection of preparations A2 and A3. It was again detected 48 hours after injection, but was not detected 96 hours after injection.

(2) Preparation B2 (0·45 g. injected intravenously). Minimal curative dose for mice 0·05 mg. per g. (low activity).

Case No.	Syphilis present: duration in weeks.	*S. pallida* detected on dark-ground examination: hours after first injection.		
		18–20.	48.	72
1	Primary advanced, 4 (?). S.P., abundant in chancre, skin, body of penis.	Present	0	0
2	Primary advanced, 6. S.P., chancre prepuce.	0	0	0
3	Primary advanced, 5. S.P., chancre prepuce.	Active and abundant	Active	0
4	Secondary advanced, 26. Condylomata anus. S.P., chancre coronal sulcus.	Abundant	Active	Active*
5	Secondary advanced, 9–12. S.P., papule abdomen.	0	0	—
6	Secondary (clinical relapse after treatment). S.P., papule scrotum.	Active.	0	—
7	Primary, 4–5. S.P., chancre prepuce.	Numerous and active.	Scanty	0
8	Secondary, 26. S.P., left shoulder.	Active and abundant	Active	0
9	Secondary (clinical relapse 4 years after 606). S.P., papule mucous membrane prepuce.	Active	0	—
10	Primary, 5. S.P., chancre mucous membrane prepuce.	Active	0	—

Remarks.—An injection of 0·45 g. preparation B2 (intravenous) failed to destroy *S. pallida* in surface lesions in 18–20 hours in eight out of 10 cases.

* None detected 168 hours after first injection.

(3) Preparation B3 (0·45 g. injected intravenously). Minimal curative dose for mice 0·015 mg. per g. (high activity).

Case No.	Syphilis present: duration in weeks.	*S. pallida* detected on dark-ground examination: hours after first injection.
		18–20.
1	† Recurrence in 13 months after 914. S.P., chancre mucous membrane of prepuce.	0* (2 exams.)
2	Primary, 5. S.P., chancre coronal sulcus.	0 (2 exams.)
3	Primary, 4. S.P., chancre coronal sulcus.	0 (2 exams.)
4	Primary, 5. S.P., chancre, skin, body penis.	0 (2 exams.)
5	Primary, 6. S.P., chancre coronal sulcus.	0 (3 exams.)
6	Primary, 5. S.P., chancre coronal sulcus.	0 (2 exams.)

Remarks.—*S. pallida* could not be detected in 18–20 hours after an intravenous injection of 0·45 g. preparation B3 in six out of six cases.

* None detected 48 hours after first injection.

(4) Preparation C2 (0·45 g. injected intravenously). Minimal curative dose for mice 0·03 mg. per g. (moderate activity).

Case No.	Syphilis present: duration in weeks.	*S. pallida* detected on dark-ground examination: hours after first injection.	
		18–20.	48, 72, and 96.
1	Primary, 4. S.P., papule prepuce.	Present.	0
2	Primary, 4–5. S.P., chancre frænum.	Present.	0
3	Primary, 4. S.P., sore coronal sulcus.	Present.	0
4	Secondary, 10 (approx.). S.P., in sore junction penis and scrotum.	0 (7 exams.)	0
5	Secondary, 10 (approx.). S.P., chancre frænum.	0 (5 exams.)	0
6	Secondary, 10 (approx.). S.P., in meatal sore.	0 (4 exams.)	0

Remarks.—In three out of six cases *S. pallida* was detected in 18–20 hours after an intravenous injection of 0·45 g. of preparation C2.

(5) Preparation C3 (0·45 g. injected intravenously). Minimal curative dose for mice 0·02 mg. per g. (high activity).

Case No.	Syphilis present: duration in weeks.	*S. pallida* detected on dark-ground examination: hours after first injection.		
		18–24.	48	72.
1	Primary, 4. S.P., chancre frænum.	0	0	0
2	Primary advanced, 5. S.P., chancre coronal sulcus.	0	0	0
3	Primary, 5. S.P., chancre coronal sulcus.	Present.	0 (2 exams.)	0
4	Secondary, 8. S.P., chancre, skin, body of penis.	0	0† (3 exams.)	0
5	Secondary 13 (approx.). S.P., condylomata anus.	0 (3 exams.)	0	0
6	Secondary, 8. S.P., Rt. buttock and papule scrotum.	0*	0	0

* Buttock and scrotum. † Gland puncture and chancre.

Remarks.—In one out of six cases *S. pallida* could still be detected after an intravenous injection of 0·45 g. preparation C3.

demonstrated by dark-ground illumination by one, and frequently both of us, in such lesion as was selected for the investigation, prior to the administration of the 914 injection; also the examination for spirochætes in the lesions subsequent to the injection of the drug under investigation was very thorough. It was not until several specimens taken from the depth of such lesions had been carefully examined for spirochætes by dark-ground illumination with negative results that "none detected" was recorded.

The dose in each series, and in every case, was 0·45 g. dissolved in 10 c.cm. *Aqua dest.*, and was administered intravenously. The subsequent examinations for spirochætes were carried out 18–20, 48, and 72 hours after each injection. By the term "duration" is meant the time that elapsed since infection to the date of the first injection.

IV. CONCLUSIONS.

Putting together the results obtained by experimental and clinical testing of the preparations which were submitted to both kinds of examination, we obtain the comparison shown in Table VI. The

TABLE VI.

Preparation.	Minimal curative dose for mice infected with *T. equiperdum*.	Proportion of human cases in which spirochætes were detected 18–20 hours after injection of 0·45 g.
B3	0·015	0 out of 6
A2	0·02	0 ,, ,, 4
A3	0·02	1 ,, ,, 6
C3	0·02	1 ,, ,, 6
C2	0·03	3 ,, ,, 6
B2	0·05	9 ,, ,,10

clinical observations which enable a differentiation to be made are the examinations for the presence of spirochætes made 18–20 hours after the administration of the dose of 0·45 g. Ideally the effects of lower doses should have been compared at later periods after administration, but the number of suitable cases available made this impracticable. With the chosen dose of 0·45 g., the examinations at later periods obviously had relatively little significance. Even with the worst of the preparations the spirochætes had been so affected by the third or fourth day that they were no longer discoverable in the superficial lesions. On the other hand, the experimental results showed that the effects of larger doses 24 hours after administration afforded a less regular basis of comparison than those of smaller doses after 72 hours. In comparing the experimental findings with the clinical, therefore, we are frankly comparing the results of estimates made on two different bases. When it is further remembered that, with all the care exercised by the clinical workers in the selection of cases, nothing approaching uniformity of the experimental infection could be expected, the correspondence of the two sets of results is surprisingly good. In no case does a preparation, giving evidence of weaker action by the experimental measurement, make as good a showing, by the widely different clinical method of appraisement, as one which is experimentally its superior. If the preparations are arranged in their order of activity by the two methods, the orders are identical. No closer correspondence could be expected under the conditions of the comparison, and the correspondence obtained is so good as to justify, in our opinion, the conclusion that the determination of the therapeutic action on mice infected with trypanosomes is, at least, a very valuable index, if not an accurately quantitative measure, of the therapeutic activity of different samples of a preparation such as 914 on syphilis in man. The method has, accordingly, been put into routine use in the Medical Research Council's Department of Biological Standards at Hampstead, an occasional check of therapeutic activity being thus imposed, in addition to the regular testing of every batch of such products for absence of undue toxicity.

LITERARY INTELLIGENCE.—The U.S.A. Association of Military Surgeons announce the forthcoming publication of "Notes on the History of Military Medicine," being the collected articles by Lt.-Col. Fielding H. Garrison which have appeared under that title in the *Military Surgeon* since November, 1921, and will be concluded in the July issue.

AN EXPERIMENTAL INVESTIGATION OF THE

CORPUS LUTEUM IN ITS RELATION TO THE TOXÆMIAS OF PREGNANCY.

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AND

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1. *Introduction.*

IN the present paper we propose to give a short summary of the investigations we have made upon the functions of the corpus luteum in relationship more particularly to the toxæmias of pregnancy. The work was initiated with the express purpose of attacking the problem of the causation of eclampsia, the origin of which is still unknown. The condition has been aptly described as a "disease of theories," and we hope to present data, largely experimental in character, to place these dread complications of pregnancy on a more scientific foundation.

2. *Chemical Pathology of the Toxæmias of Pregnancy.*

For several years one of us (R. L. M. W.) has been interested in the chemical changes observed in the blood and urine in normal and abnormal pregnancies. In a recent paper certain tests were described which had been found to be of value in differential diagnosis between nephritis in pregnancy and toxic manifestations. The results of the blood and urinary analyses in toxæmias led to the conclusion that the toxin or toxins acted directly on the maternal circulation, producing particularly changes in the capillary tufts of the glomeruli—i.e., a glomerulosis or nephrosis. The result of this change was to render the glomeruli hyper-permeable, and as a result the urine showed a high diastase content, high normal urinary sugar, and normal urea content. This produced a corresponding diminution in the blood both of diastase, sugar, and urea. These changes are much more marked in the early stages of the disease, and the kidney appeared to be the chief organ affected at this stage. Later the tubules of the kidney are affected, and then the urinary characters approach those met with in chronic parenchymatous nephritis. At a still later stage the clinical picture is altered by the concomitant changes in other organs, particularly the liver, lungs, and brain. In this stage the prognosis is, of course, distinctly unfavourable. At first it was thought that the changes in the urine might be ascribed to necrosis of the pancreas, but apart from the high urinary diastase there was no evidence to support such a conclusion. The placental origin of eclampsia has been upheld by many authorities, and this still holds the field. The introduction of Abderhalden's test for pregnancy was hailed as an additional argument in favour of this theory. In applying the test to cases of eclampsia the results showed that there was no evidence of an excess of placental protein and protective ferment in this condition, but rather the reverse. The test, however, has not stood the passage of time, so that we do not wish to advocate this argument either for or against the placental theory. One of us (R. L. M. W.) has been a strong supporter of the placental theory, and in discussing the subject the question of the part played by the corpus luteum was raised by H. G. E. W.[1] The result was a combined attack on this interesting problem and the data obtained are given in a summarised form below. We would point out that the present paper is in the nature of a preliminary communication recording our own observations, without exploring the realms of theory, or attempting to explain all the various manifestations of pregnancy which have been recorded in the past.

3. *The Mode of Preparation of Corpus Luteum Extracts.*

The corpus luteum has been the subject of investigation by many workers, both in the field of comparative anatomy and also in its developmental and histological changes. All are apparently agreed in placing the corpus luteum in the endocrine system of glands. So far no one has succeeded in isolating the active principle or principles of this gland, although many commercial preparations are made and advocated as cures for many female maladies. In a trial of these various preparations we were not convinced of their efficiency as providing the internal secretion, and from subsequent work upon the subject it would appear eminently desirable that they should not possess this substance. It was clear at the outset that some new method of preparation should be adopted. The details of our failures need not be recorded here, but suffice it to say that only absolutely fresh corpus luteum was found to be of value for this purpose. The extraction was carried out in the cold with alcohol as the extractive, and in the subsequent manipulations the temperature of the solution was never allowed to rise above 56° C. A solution of the substance was made up in saline, and proved to be protein free. From its reactions and chemical composition the substance appears to be associated with a lipoid. There was no cholesterol present, and no choline, histamine, or tyramine could be found. It is destroyed by heat, and rapidly deteriorates when in solution. Fresh solutions of the active substance were made up as required, and the results of injection into animals are recorded below. The source of the material was largely from the ovaries of the pig obtained immediately after killing, and also from the corpus luteum of human subjects removed by operation. The extractives from both sources were identical in their reaction. The fact that the corpus luteum of pregnant women contains such an active principle receives further corroboration as the rest of the application of a new test for pregnancy. The highly refractile solution was found to undergo destruction when incubated with the serum of a pregnant woman, and in every case tried this was found to be the case. The test was also positive in women during the early stages of menstruation. The same test applied to the serum of non-pregnant women, and also to males, was consistently negative. The changes are observed by means of the refractometer, and since the test does not require to be quantitative, minute differences in the readings may be neglected. At the moment the control observations exceed the actual tests in number, and this mode of procedure appears to be justifiable with any new test. In our opinion these important observations provide us with a very valuable link in the chain of our research.

4. *Animal Experiments.*

In the following experiments, clear protein-free solutions were used in all cases. We believe these are the first recorded experiments in which extractives of this kind have been used, and which are therefore free from the objection of injecting animals with foreign proteins. In all cases the animals used for injection purposes were rabbits.

Expt. A.—Intravenous injection of 5 c.cm. of a solution of corpus luteum extract from the pig. Animal very ill, and died within 18 hours. Sections taken from various organs showed no marked histological changes.

[1] The latter was strongly opposed to the placental theory on several grounds. He holds that the toxæmia of pregnancy must arise from some body which is present in the maternal tissues as early as the sixteenth week of pregnancy (which is the earliest date at which toxic symptoms appear) throughout the pregnancy, and in the early days of the puerperium (when post-partum eclampsia occurs). It follows that this body is not in the fœtus, because in a molar pregnancy there is no fœtus, nor is it considered likely to be in the placenta. The only other body which satisfies the condition is the corpus luteum of pregnancy which is present from the time of fertilisation and persists throughout the pregnancy until about 14 days in the puerperium. In passing it may be recalled that the most severe type of toxæmia may be met with in molar pregnancy.

Expt. B.—Repeated intravenous injection of sub-lethal doses of similar extract to that of preceding experiment. Animal killed three weeks later. Sections prepared from kidneys showed massive necrosis of convoluted tubules. No other changes of note. Sections from the liver showed round-celled infiltration in the portal zone. Some of the cells showed vacuolation and absence of nuclei. Other sections stained by Best's carmine stain showed these changes cannot be attributed entirely to glycogenic infiltration.

Expt. C.—One intravenous injection of human corpus luteum prepared in a similar manner. Sections show identical changes with the foregoing though less well marked. Many of the glomeruli are swollen and do not take the stain.

Expt. D.—Intravenous injection, with an extract prepared from cysts (from a case of chronic epithelioma following hydatidiform mole). Two injections at four-day intervals. Animal killed three weeks later. Histological appearances in kidneys similar to those in Expt. B, but less well marked.

Control Expts.—Extracts prepared from human placentæ obtained from Cæsarean section. Two injections at four-day intervals. Three animals used, varying doses up to 8 c.cm. given. Histological appearance of all organs normal.

Expt. E.—Intravenous injection of hydatidiform mole extracted as previously. Animal killed three days later. Histological appearance of liver and kidneys normal.

Expt. F.—Intravenous injection with synthetic amine. Animal killed three weeks later. Sections of kidney showed massive necrosis of convoluted tubules, otherwise no gross changes.

Expt. G.—Intravenous injection with three times a toxic dose of synthetic amine + cholesterol. Animal not affected and is still alive and well. This experiment has been repeated with a similar result. A 1 per cent. solution of cholesterol is injected immediately following the injection of the amine.

Summary of Animal Experiments.—1. These experiments clearly indicate the toxicity of corpus luteum extracts. 2. The lesions produced are most marked in the kidneys, in which organ the effects are immediate. Later, the liver shows changes, but these lesions are, in the rabbit, less well marked than in the kidneys. 3. Extracts prepared from the placenta and from hydatidiform mole, under identical conditions, are non-toxic. 4. The simultaneous injection of cholesterol profoundly modifies the effect of injecting the highly toxic synthetic amine.

5. *Summary and Conclusions.*

In this paper we have attempted to record our observations and to show in as short a form as possible the trend of our own particular work. In view of the necessity of curtailing its length we have omitted any reference to the work of others, but we hope to have an opportunity of making a more extended communication later. The results have been so surprising that we have hesitated to record them until satisfied that there was no weak spot in our conclusions. Further, we had no desire to propagate another theory to add to a disease already overburdened with such. Consequently, we have laid plans to destroy our observations, but signally failed in this endeavour. The whole subject is perhaps one of the most fascinating in medicine, and the functions of the corpus luteum in relationship to certain disorders of pregnancy worthy of attention. Where else could one find in the realms of medicine a subject upon which endless time could be spent in mere speculation? There is, however, the dread complications, the toxæmias calling for immediate and safe treatment. Is it possible with the present data at our disposal to correlate this toxic substance in the corpus luteum, and the changes observed in animals with the production of eclampsia? The suggestion has been made by certain writers that the toxæmia is due to deficiency of the corpus luteum, yet, as far as we know, surgical removal has not produced eclampsia or toxic vomiting. We hold quite the reverse view, and that is that hyperactivity of the corpus luteum is the cause—a positive and not a negative action. This hyperactivity, both in menstruation and pregnancy, stimulates the thyroid gland to increased activity presumably in order to counterbalance this, besides setting into action the destructive agent in the blood-stream. Nature again tends to overproduction, but provides the mechanisms for combating it at the same time. A failure of the mechanism results in a quantity of this substance pouring out of the corpus luteum into the general circulation, with the production of toxic vomiting and eclampsia.

The presence of a hypercholesterolæmia—i.e., an excess of cholesterol in the blood in pregnancy—is significant, especially as the increase occurs about the fourth month and at a time when the corpus luteum is most active. The blood remains charged with cholesterol until a varying period after labour. In eclampsia much higher figures for cholesterol are found than in normal pregnancy. Further, it has been shown that injections of corpus luteum extract increase the cholesterol content of the blood. In our opinion the presence of excess of cholesterol is of great significance, and we suggest that it represents an attempt on the part of the body to neutralise the toxic substance elaborated by the corpus luteum. The extracts we have prepared do not contain any cholesterol, yet when injected into animals produce lesions identical with those found in eclampsia. The first change appears to fall largely on the kidneys, producing necrosis and death of the renal cells. The liver does not suffer to a similar extent except after repeated sublethal doses, and then areas of focal necrosis may be detected. Extracts from other organs treated in a similar manner have no such immediate and remote effects—e.g., fresh human placenta, fresh pig's pancreas, sheep's thyroid, &c. The experimental observations are so clear cut as to leave no room for doubt that the corpus luteum does contain a very toxic substance, which in moderately large doses causes death in animals, with convulsions, but in smaller doses produces a severe illness with degenerative changes in the kidneys and liver. The lesions produced are identical with those found in patients dying from eclampsia, and there is abundant evidence from the ætiology of this disease to support such a conclusion. Apart from the experimental evidence of the effects of this corpus luteum extract the results throw some light upon the functions of the corpus luteum. Removal of the corpus luteum during pregnancy may produce abortion, but never a toxæmia. The toxic substance when oxidised shows pigment formation, and it is interesting to correlate this with the pigmentation of the nipples, &c., so characteristic a feature of pregnancy. Again, if, as we believe, the body protects itself by means of cholesterol against this poisonous substance, we have an explanation of the changes observed in the cholesterol content of the blood. Finally we have succeeded in applying the knowledge gained in this research to the diagnosis of pregnancy. The blood of a pregnant woman is capable of destroying the corpus luteum extract, apparently by oxidation, and use is made of this fact as the basis of the test. The blood of a woman during the menstrual period possesses a similar property and this would appear to provide additional evidence in support of the main function of the corpus luteum. We therefore submit these observations in the hope that interest in this subject will be stimulated, and that evidence will be forthcoming from the clinical side to either prove or disprove our main contentions. The subject is a vast one, and we do not claim that the substance we have isolated is the only active principle of the corpus luteum, or that all the functions of the corpus luteum in menstruation and pregnancy thereby receive a full explanation.

Our conclusions are as follows:—

1. From the corpus luteum a chemical compound has been isolated which produces necrosis and other changes in animals very similar to those found in the toxæmias of pregnancy.

2. This substance is not present in the placenta nor in a hydatidiform mole.

3. The overproduction of this toxic substance is the cause of the toxæmias of pregnancy, and the results emphasise the important functions of the corpus luteum in pregnancy.

4. The results of these investigations throw light upon the association of activity of the corpus luteum with many of the clinical manifestations of pregnancy, and further form the basis of a new test for pregnancy.

5. The cause having been obtained, progress in treatment necessarily follows.

AN APPARATUS FOR THE MEASUREMENT OF SMALL QUANTITIES OF FLUID.[1]

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THIS apparatus for measuring volumes of fluid from 0·5 c.cm. to 0·005 c.cm., with an accuracy of 1 per cent., was designed to measure 0·02 c.cm. of diphtheria toxin into capillary tubes for the performance of the Schick test, but can be used for any titration which involves the making of high dilutions—e.g., the Wassermann or other serological reactions.

It consists of a good 1 c.cm. syringe (all-glass "tuberculin" or record) and an engineering micrometer head, clamped in line by brass clamps to a ¼ inch steel rod. The micrometer head is graduated in one-hundredths of a millimetre; its motion pushes the piston of the syringe, and the fluid to be measured is delivered through a steel (preferably rustless) needle under the surface of the diluent (to avoid drop errors). The knob on the piston is either ground plane or drawn out to a rounded point. The instrument can be calibrated roughly by measuring the distance between the marks on the syringe and calculating the volume corresponding to 1/100 mm. (=1/50 of a turn of the head of the micrometer), or by weighing mercury delivered.

The piston must be thoroughly wetted with the fluid to be used before setting up. The usual micrometer found in most laboratories can be used if a copper trough is made and arranged so that the anvil of the micrometer fits into the hollow of the trough, one end of which clips on to the knob of the piston, and the other is closed by a flat plate on which the plunger of the micrometer works.

Calibration of successive turns gave the following results:—

1. By weighing mercury: 34 readings, 1 turn of the head of the micrometer = 0·1276 ± 0·0094 g. mercury = less than 1 per cent. Corresponds to 0·0190 c.cm. per mm. Direct measurement gave 0·0192 c.cm. per mm.

2. By ejecting 50 per cent. calcium chloride under the surface of water in a beaker and titrating with N/50 $AgNO_3$ and chromate: (*a*) All-glass 1 c.cm. syringe. 4 turns, 8 readings gave 10·91 c.cm. $AgNO_3$ average, extreme error 0·05 c.cm. $AgNO_3$ = less than 1 per cent. (*b*) Record 0·3 c.cm. syringe gave 6·317 c.cm. $AgNO_3$ for 4 turns (about 0·02 c.cm.) extreme error 0·055 c.cm. $AgNO_3$ = less than 1 per cent.

3. By measuring the number of turns to eject a standard drop of fluid: (*a*) All-glass syringe, 34 readings: 1 drop = 1·0263 mm., extreme error = 0·0075 mm. = 0·76 per cent. on a volume of 0·0190 c.cm. (*b*) Record syringe: using mercury as a dropping fluid, volume of 1 drop 0·0001 c.cm., 10 drops of mercury (0·001 c.cm.) = 0·099 to 0·109 mm. movement of the micrometer head; error less than 5 per cent. The chance of the mercury drop varying in volume is so great owing to the ease with which it becomes contaminated that the error of the method of calibration is probably greater than the error of the measurement by the syringe.

[1] Shown at the Pathological Section of the Royal Society of Medicine, Feb. 21st, 1922.

RUPTURE OF CÆSAREAN SECTION SCAR

IN SUBSEQUENT PREGNANCY OR LABOUR.*

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IN former days contracted pelvis was the only indication for Cæsarean section and repeated operation the only method of delivery in subsequent pregnancies, when scars were seldom overstrained by labour. Nowadays the scope of the operation is much wider, and the accepted indications include such complications of pregnancy as tumours obstructing labour, eclampsia, prolapsed cord, severe accidental hæmorrhage, rigidity of the cervix and vagina. These are conditions which need not prevent a woman, in the event of a further pregnancy, from delivering herself by the natural passages, when the scar will be subjected to severe strain and possible rupture.

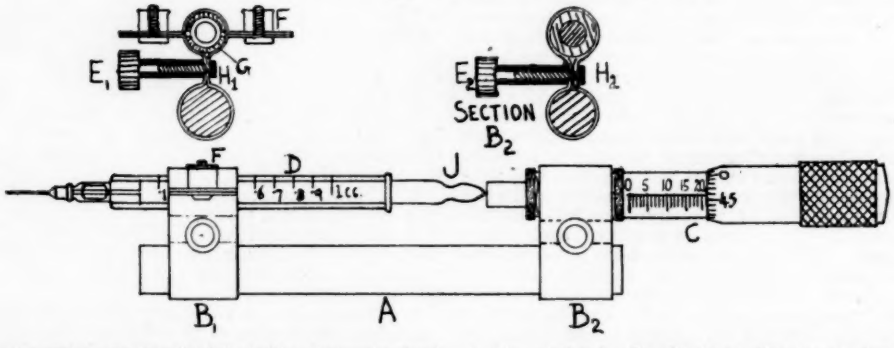
In the present case a primigravida, aged 24, with a contracted pelvis was submitted to Cæsarean section on March 28th, 1918. The patient was in labour 22 hours and many vaginal examinations were made before the operation. The uterus was opened by the usual anterior median incision and subsequently sutured with three layers of formalin catgut, a layer for the endometrium, a deep buried layer including the whole thickness of the muscle, and a peritoneal layer. The placental site was not noted; a living female child was extracted. About the fifth day the patient had a severe rigor, temp. 104° F. The discharge from the uterus became fœtid and the uterus was washed out, when pieces of suture and debris came away. Recovery was protracted.

Second Pregnancy.—Readmitted to hospital June 9th, 1920. The patient was in labour six hours before the operation. No vaginal examinations were made. Dr. C. operated as on the first occasion, and delivered a living female child; the patient made a good recovery.

Third Pregnancy.—Readmitted Sept. 21st, 1921. The patient was in labour 18 hours before the operation. No vaginal examinations were made. The only distress complained of being slight tenderness over the abdomen when the nurse was preparing her for the operation.

* Read at a meeting of the Ulster Medical Society.

The Apparatus for Measuring Small Quantities of Fluid.



Micrometer syringe made with detachable micrometer head. A, ¼ in. steel rod. B1, B2, brass clips (see section above). C, micrometer head, which can be obtained at any tool shop, 25 mm. in 1/100 mm. D, 1 c.cm. "tuberculin" syringe. E1, E2, milled heads with screw in shank, for tightening clips; the male screw, H, fits into these and is soldered to the clip. F, electrical binding screws for fixing syringe in clip. G, chamois leather lining. J, head of piston drawn out to a point and rounded off; this is devised to prevent errors due to the irregularity of the usual surface of the piston head. The same result could be obtained by grinding the head of the piston to a flat surface.

Operation.—The abdomen appeared irregular with a tumour filling the lower half and upper right quadrant. On opening the abdomen I found the dead fœtus and placenta free in the peritoneal cavity, and lying just outside a large gaping rent in the anterior wall of the uterus. After removing the fœtus and placenta attention was turned to the uterus, which was rigidly contracted and anæmic; a long widely-gaping rupture occupied almost the whole length of the anterior wall (Figs. 1 and 2). The rupture looked like a clean tear except at its upper end, where it extended laterally to a slight extent. Its edges are thick and smooth, giving the false impression that the rupture occurred through the entire thickness of the uterine wall. Projecting from the thick edge of one side is a ragged leaf of thickened peritoneum. This is in reality the stretched scar, which ruptured not along its middle but along the junction with the other thick edge. At the lower end of the rupture there is a bridge of thickened peritoneum passing between the two edges of the ununited muscle (Fig. 2). The uterus was removed by sub-total hysterectomy. The patient made a good recovery.

Clinical Points.

There are two varieties of ruptured uterus. Cases with acute symptoms, sudden collapse, signs of intra-peritoneal hæmorrhage, cessation of labour pains, and the distinct feeling on abdominal palpation of the fœtus and the contracted uterus. These symptoms are met with when the rupture has occurred through the whole thickness of the uterine wall.

Cases with absence of or very slight symptoms. In these cases the rupture occurs in a membranous and avascular scar quietly and gradually during the later stages of pregnancy or early in labour. The membranous scar yields at one point, a small bag of membranes bulges through, and labour continues through a gradually yielding scar until the ovum is born into the peritoneal cavity. The severity of the symptoms will depend upon the position of the placenta. If the placenta is implanted over the scar even a small perforation may be accompanied by a severe intraperitoneal hæmorrhage. If the placenta is well away from the scar it separates and is expelled into the peritoneal cavity with very little more hæmorrhage than occurs after a normal labour.

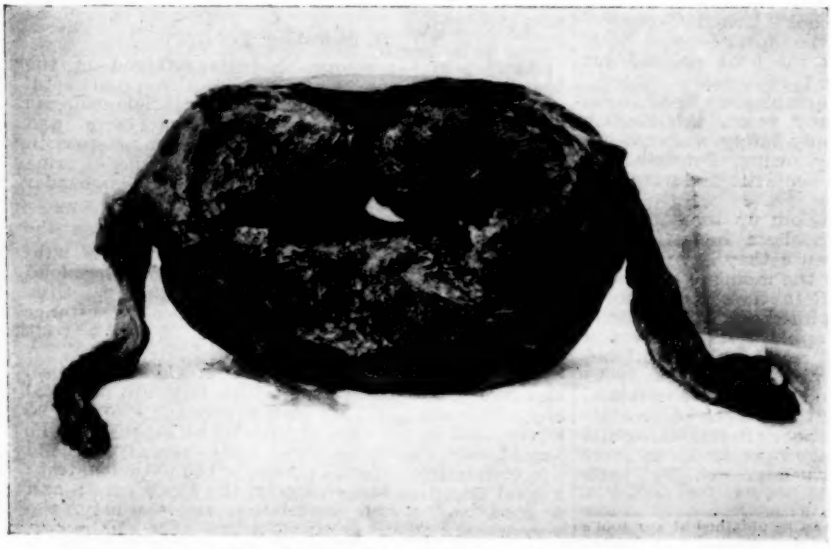
Time of Rupture.—In the reported cases collected by Eardley Holland rupture occurred almost as often during pregnancy as during labour, the proportion being three to four, the frequency being 4 per cent.

Causes of Rupture.—Perfect healing of the uterine incision may result in complete muscular regeneration, leaving no trace of scar tissue except on the peritoneal surface. The difficulty is to secure complete asepsis in the uterine wound because of the double danger of infection from the abdominal wound and from below, especially in cases previously examined and interfered with from the vagina. As in all wounds, sepsis is the most important cause of rupture, causing as it does imperfect healing of the uterine incision. Another factor is that the ligatures have to be employed not only as coaptors but also as hæmostatic agents in an organ which subsequent to operation is not only in a state of unrest, but is also in a state of autolysis. This causes a yielding of the sutures employed to close the incision and the muscular surfaces will retract and become widely separated. The peritoneum, on the contrary, holds firm and in course of time becomes covered by a layer of endometrium, which in a subsequent pregnancy is converted into decidua. Further thinning of this peritoneal-decidual scar is the natural sequence of the progressive distension of the uterus during pregnancy, the scar being gradually converted into

FIG. 1.

Ruptured uterus, anterior view.

FIG. 2.



Ruptured uterus, looking from above downwards.

a widely stretched area. These peritoneal-decidual scars are the ones most likely to rupture during pregnancy or labour from a rise in intra-uterine pressure.

How Can Conditions be Improved?

These conditions can be improved firstly by practising such measures as will prevent sepsis. The pelvis should be carefully examined some time before the commencement of labour, and if pelvic contraction or other deformity is found, appropriate treatment should be given. At the time of operation delivery of the placenta should be per vaginam to prevent the cervical portion of the membranes causing contamination. The uterus should be swabbed with an antiseptic lotion and then douched from above through the uterine incision, allowing the lotion to run out freely through the dilated cervix below. Careful uterine suturing during retraction, not during contraction, should be carried out. The material used for the sutures does not matter, the chief point is that the sutures should start well outside the edge of the incision, so as to include a good thickness of the uterine wall, except the decidua. After this layer is tied the peritoneal edges are accurately united. An alternative operation is the lower segment or cervical method which has lately been revived with a greatly improved technique; its chief exponent in this country is Prof. Munro Kerr.[1]

TESTS OF RENAL EFFICIENCY.*

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CLOSELY following the physiologists in the "seventies" and "eighties" of last century, the urinary surgeons searched for clinical tests of renal efficiency; they had urgent need for such tests, not only when considering nephrectomy and prostatectomy, but also when planning many other operations on the kidney or bladder. During the later years of last century, and in the first decade of the present century, Albarran and Kapsammer and their pupils were doing pioneer work in applying physiological knowledge to clinical purposes in order to find practical tests for estimating the power of the kidneys. These tests were, I believe, first introduced to English medicine in a book by Mr. Thomson Walker, "The Renal Function in Urinary Surgery" (1908); and in my book "Urinary Surgery" (1910) I passed in review the special renal tests then in use, and throughout the book pointed out how they should be employed in urinary surgery. Though some of us have employed these tests as routine measures for many years, the English profession as a whole has only lately wakened up to their importance—largely owing, I believe, to the prevalence of "trench nephritis" during the war.

Some of those who have taken up these tests in the last few years with enthusiasm have, I think, been led into confusion, because they have applied certain tests, fashionable at the moment, and have recorded them in great detail in their case records without much attempt to interpret the results; but it is of little use to apply tests unless you know how to interpret the results obtained, and also know on which to rely of all the numerous tests that have been placed on the theoretical market. Others have denied the benefit of prostatectomy to patients with poor functional renal tests, unaware that a two-stage operation can steer the way safely past kidneys depressed by back pressure.

[1] THE LANCET, 1920, i., 1065.

* A paper based on a contribution to a discussion of Tests of Renal Function, held at the Section of Urology of the Royal Society of Medicine.

The Surgeon's Problems.

As regards tests of renal efficiency, the surgeon is particularly interested in two problems. (1) In considering prostatectomy to know if the kidneys are so far destroyed by back pressure as to necessitate the carrying out of the operation in two stages. (2) In considering nephrectomy of one diseased kidney, to know if another kidney is present and fit to carry on if left by itself. In answering these questions *renal function tests cannot stand by themselves;* they must always be coördinated with all other clinical evidence available in any particular case.

A proof that these tests are of great value is that since their universal adoption by urinary surgeons the results of nephrectomy and prostatectomy have improved in a remarkable manner. The percentage mortality of nephrectomy has fallen from 40 per cent. in the latter end of last century to less than 2 per cent., and that of prostatectomy from 30 per cent. to less than 5 per cent. at the present day.

CLASSIFICATION OF "RENAL EFFICIENCY" TESTS.

Tests can be time tests pure and simple, or more elaborate quantitative tests. *Time tests* are found to be more reliable in practice than *quantitative tests*, and they are more easily carried out by the clinician.

A. *Excretion Tests.*

Applied to bodies excreted in the urine—time and quantitative tests.

1. *No Artificial Stimulation.*—Average daily quantity of water, colour, specific gravity, urea, chlorides, phosphates, albumin. Cryoscopy (Dreser 1892, Koranyi 1897) and index of refraction-measure of the molecular content of the urine. Measurement of electrical resistance (ionic content) after the method of Kohlrausch (Richter 1903, Dawson Turner 1906–07, Leyton 1912). Diastase (Wohlgemuth 1908–11), lactose, benzoic acid (1879).

2. *Artificial Stimulation.*—Time tests and quantitative tests applied by injecting certain substances into the tissues and noting their appearance in the urine. *Dye-stuffs:* Indigo-carmine (Heidenhain 1874, Voelcker and Joseph 1903); phenolsulphonephthalein (Rowntree and Geraghty 1910–12); methylene-blue (Casper 1892, obsolete because partially excreted as a colourless chromagen); fuchsin; rosanilin, &c. *Drugs:* Phloridzin—sugar (von Mehring 1882, Zuntz 1888); urea (Albarran 1905, McCaskey 1913–14, Pirondini 1914); iodides; salicylates, &c. *Water:* Experimental polyuria (Albarran 1897–1903, giving excellent results but impracticable and unwise as ureteric catheters have to be left in situ for some hours). *Alkalies and acids:* Bicarbonate tolerance test (Sellard).

B. *Retention Tests.*

Applied to excretory products retained in the blood, quantitative tests only: Urea and total nitrogen of blood; acidosis and artificial acidosis; chlorides (retention in many œdema cases and possible cause of œdema and high blood pressure in parenchymatous nephritis; indican; toxicity of urine (Bouchard); cryoscopy (Koranyi 1897)—molecular content; electrical resistance—ionic content.

C. *Correlation Tests or Hæmorenal Indices.*

Comparisons made between the amount of substances in the blood and whole urine, or in the blood and the urines separated from each kidney: Urea (Ambard's constant); ions (electrical resistance method); molecules (cryoscopy); Wright's tests (hæmolysis).

The surgeon has a wide list from which to choose, and he needs a guide as to which tests are practical and which are not. My own experience leads me to advise that in the case of ureteric catheterisation he should rely chiefly on three tests—namely, a good dye test, indigo (which I prefer) or the phthalein test; a good retention test—namely, the blood urea; and a good and simple correlation test—namely, the hæmorenal index as applied by the Kohlrausch electrical resistance method, which I have found of great use and easy to employ for oneself. In prostat-

ectomy I advise a good dye test (indigo or phthalein), the blood-urea test, and the urea-concentration test. I may say at once that I find the indigo test quite as satisfactory as the phthalein test, and shall continue to use it as my sheet anchor, in spite of all that has been alleged against it by the inventors of the phthalein test. The urea-concentration test, as far as I can determine, was first employed by Albarran in 1905.[1] It appears to have been revived and restarted on a useful clinical career by McCaskey, of Fort Wayne, Indiana,[2] and by Pirondini in Rome.[3] MacLean states that he introduced the test,[4] but I do not feel convinced of this statement. It is due to MacLean's work that the test has become popularised.

PROSTATECTOMY.

In prostatectomy the surgeon wishes to detect loss of function in both kidneys, considered together, as a result of back pressure before any of the ordinary clinical signs of back pressure have appeared. In such a case he has no need to separate the urines from each kidney before applying the tests. It is often forgotten that "surgical" uræmia from back pressure is entirely different from the "medical" uræmias; for instance, œdema in "surgical" uræmia is seldom if ever seen except when there is concomitant heart failure. The early symptoms of "back-pressure" kidneys are headache and subnormal temperature, thirst, nausea, and occasional vomiting, hiccough, polyuria, persistent low specific gravity urine, high blood pressure, loss of weight, and pain in the back of the loins. If any or all of these signs are present then we know without special renal function tests that we are dealing with "back-pressure" kidneys, and the tests can only confirm our clinical findings. I find by experience, however, that in a large number of prostatic cases few if any of these signs are present, and yet the renal function tests may not be first-class, and may point to the need for an operation carried out in two stages. I have been performing prostatectomy in two stages in cases where the renal function tests are deficient for more than ten years, and have thereby been able to save by operation many patients who would otherwise have shortly succumbed to the dangers of catheter life.

Dangers of Catheter Life.

Catheter life may present little risk, though much inconvenience, to comparatively young prostatics who start upon it before the kidneys have become affected by back pressure; but experience tells me that if catheter life, or the "catheter operation" as I prefer to call it, is started after the kidneys have begun to fail, it is more dangerous than open operation done in two stages, and cannot prolong life as a successful two-stage operation can and does. In obvious cases with a giant atonic painless bladder and clear clinical signs of back pressure, *on no account whatever* should a catheter be passed for the purpose of carrying out tests. In such cases a catheter may kill in 48 hours. The only safe test to employ in such cases is an estimation of the blood urea. The bladder should simply be drained with a Pezzer tube, and the urethra left alone. Suprapubic drainage presents far less risk than catheter drainage. Tests can be carried out later through the Pezzer tube *without passing a catheter*.

Procedure in Doubtful Cases.

In doubtful cases I find "time tests" of great value and easy of execution. *In doubtful cases only*, without "giant" bladder, a catheter is passed and tied into the bladder and the urine is drawn off every quarter of an hour for one hour. I employ indigo-carmine and I expect a moderate degree of the blue to appear in the second specimen, and for a deep blue colouration to appear in the last two specimens. If this does not happen it is seldom if ever wise to operate in one stage. The phthalein test is of equal value as a time test in these cases, but I doubt if its quantitative relations are of such accuracy as has been claimed by its orginators. A colorimeter to be read by the human eye can never give values of mathematical accuracy. In these cases the blood-urea test is also excellent; it does not show up as early, nor is it so delicate, as the dye tests, but it constitutes a good auxiliary test in doubtful cases. I have seen the blood-urea test become normal after drainage of the bladder long before the indigo test has returned to normal, and long before it is really safe to perform the second stage of the operation. In the majority of prostatic cases the kidneys regain sufficient functioning power after the first stage of the operation in 10 to 14 days to enable the second stage to be carried out; but in exceptional cases the kidneys may take four to six months to recover sufficiently. It is always wiser to wait too long than to operate too early.

To illustrate these remarks the following cases may be quoted:—

CASE 1.—Male, aged 60, for a long time has passed water every half hour; no difficulty and no pain. For the last few months has had a little hæmaturia and pain at the end of the penis, a little pain in the lumbar region, and *tremendous thirst*. Rectal examination showed a very large prostate. Abdominal examination showed a giant painless bladder.

Operation.—Because of this, *on clinical evidence alone* no catheter was passed and no tests were done, but the bladder was opened and a Pezzer tube fixed in position.

The thirst disappeared in four days, the patient got up and felt perfectly well. At the end of ten days indigo tests were performed. No blue came through for over an hour. Patient was therefore sent home to wait until the kidneys recovered. He returned three weeks later. Indigo now came through in 15 minutes and there was a deep blue in 30 minutes. The prostate was shelled out; the patient healed up in three weeks, passed all his water naturally, and recovered his general health.

CASE 2.—Male, aged 57, two years' pain in hypogastrium, difficulty in passing water, greatly increased frequency of micturition. Several attacks of acute retention, relieved by catheter. For the last week has been having a catheter passed regularly. Rectal examination showed a large adenomatous prostate. Urethroscopy showed no stricture. Œdema of eyelids; thirst. Catheter passed and tied in. Indigo injected into a muscle. No blue came through in the urine until 1¼ hours had elapsed, and then only a faint tinge.

First Operation.—Oct. 7th, 1920, Pezzer tube fixed into bladder in suprapubic region. Indigo tests repeated weekly for some weeks showed little sign of improvement. Nov. 2nd, blood urea 0·086 per cent.; alkali reserve 60 = normal. Ambard's index 0·20. Excretion of acid unimpaired. Patient up and about; had lost his thirst and felt perfectly well. Dec. 7th, blood urea 0·096 per cent. (normal = 0·55 per cent.), Ambard's index 0·24 (normal = 0·06 per cent.). On the 16th urea-concentration test: First hour 120 c.cm., 1·8 per cent.; second hour 190 c.cm., 1·8 per cent.; third hour 115 c.cm., 1·7 per cent. Indigo test: A faint trace of blue comes through in three-quarters of an hour. Patient went back to business. Jan. 19th, 1921, indigo test gave same result as before. Feb. 15th, indigo test: Blue came through in a quarter of an hour and a deep blue appeared in half an hour.

Second Operation.—Feb. 25th, a large prostate enucleated. Patient had healed up and was passing all his water naturally on the twenty-fourth day, and since then has had no further trouble.

This case illustrates very well the importance of performing the operation in two stages when the kidneys are not working properly. Though the patient was a comparatively young man, yet, when first seen, he presented definite clinical signs that the kidneys were not doing their work, and all the tests except the "alkali reserve" were bad. Within a fortnight of bladder drainage the patient felt as fit as ever he did in his life; that is to say, all clinical signs of renal failure had disappeared, yet the tests were still very poor. As time went on all the tests got right except the indigo test, but I refused to operate until that test became normal When the indigo test became normal it did so quite suddenly, as is usually the case. The indigo test was the last test to become normal, which shows that it is the most sensitive and satisfactory test and the one that should be the chief

[1] Functional Diagnosis of Kidney Disease, Paris, 1905, p. 31, quoted by McCaskey.
[2] Medical Record, 1914, March 21st, p. 507.
[3] Journal d'Urologie, 1914, pp. 498, 499.
[4] Modern Methods in the Diagnosis and Treatment of Renal Disease, 1921, p. 53.

guide when considering the time for the second stage of the operation on the prostate.

CASE 3.—Male, aged 74. History of some months' difficulty in passing water, increased frequency, hæmaturia. Rectal examination showed a large adenomatous prostate; cystoscopy showed uric acid stones behind the prostate. Indigo came through in quarter of an hour, and in half an hour the urine was deeply blue. The urea was 34 mg. in 100 c.cm. of blood. Operation performed in one stage. Patient did well.

NEPHRECTOMY.—CATHETERISATION OF URETERS.

In considering the problem of nephrectomy tests must be applied to the urines separated from each kidney. Separators of the Luys and Cathelin type are dangerous and useless and should become obsolete. At the present day the urines should be separated by means of ureteric catheters; there are, however, certain important principles to be kept in mind in the practical application of these tests by means of ureteric catheters. These are as follows:—

1. There is no method yet arrived at by means of which the surgeon can be absolutely certain that he has collected all the urine in a given time from each kidney. Even if he empties the bladder at the beginning and end of the session he is still subjected to fallacies. For that reason alone I doubt if any *quantitative* tests applied to ureteric catheter specimens are worth the trouble, as they are bound to lack accuracy.

2. The mere passage of a ureteric catheter upsets the *quantitative* renal balance for a time, varying in duration with the individual, and for each kidney; but that passage *does not upset the time-values*. Ureteric catheterisation produces temporary anuria, oliguria, or polyuria in a degree which varies even in the two kidneys being tested, and influences the water more than the solids. Again we see that quantitative tests are likely to be fallacious, but fortunately the time-values are not upset. Some portion of the dye or drug injected will come through within 10 to 15 minutes if the kidney is healthy, unless reflex anuria is prolonged for more than this time, which it seldom if ever is.

3. Anæsthetics and fear of examination produce similar fallacies in the quantitative values.

4. Seeing, then, that quantitative tests as applied to ureteric catheter specimens are likely to be fallacious, and that it is very unwise to leave ureteric catheters in situ for more than a few mintues at a time (I cannot too strongly emphasise this point), I warn students not to apply quantitative tests which necessitate leaving ureteric catheters in place for an hour to several hours (urea-concentration test, experimental polyuria, &c.). The prolonged in-dwelling of ureteric catheters sets up a ureteritis which may cause intense pain in, infection of, or damage to a previously healthy kidney.

5. Finally, disease of one kidney (especially neoplasm and hydronephrosis) may so depress the function of the other kidney that it is unwise always to refuse nephrectomy simply because of doubtful functional tests. If the blood-urea is satisfactory, and if other clinical factors point the road, it is better to give the patient the benefit of the doubt if his disease of one kidney is likely to prove fatal without operation, and if there is reasonable evidence that another kidney is anatomically present and is not pathologically altered, even though it may not show up perfectly when considered functionally.

6. In certain cases of ureteric catheterisation, much time can be saved by injecting a drug or a dye intravenously rather than intramuscularly.

Summary.

To sum up, I would advise the following tests as of value in the case of ureteric catheterisation when considering nephrectomy:—

(*a*) Employ time tests pure and simple rather than quantitative tests. The time of the first appearance of indigo or phthalein is the important matter, not its amount. Time tests avoid the necessity for measuring the exact quantity of urine passed in a given time by each kidney.

(*b*) Instantaneous simultaneous correlation tests applied to the blood and each urine may be of value in doubtful cases. I have found of considerable value the electrical resistance test applied to a drop of blood serum taken while the ureteric catheters are in situ and applied also to a drop of urine taken from each kidney at the same time. A few drops of fluid only are required in this test, as compared with the large quantity needed for the cryoscopy and blood-urea hæmorenal indices. This is why it is to be preferred in practice.

(*c*) The percentage of urea taken from the separated urines has often appeared to me of value, though in theory it should not be accurate. It is at any rate of more accuracy than attempts to measure the total quantity of urea passed in a certain time.

(*d*) Pathological and anatomical (pyelographic) considerations should not be forgotten; in practice the problem is usually solved satisfactorily by correlating them with functional considerations—e.g., does the urine from the poor kidney contain blood, pus, bacteria, as compared with the urine from the good kidney which is of good colour, free from pathological elements, and gives a good time test? Pyelography is a useful handmaid, concerning itself as it does with the surgical anatomy, and is often of more value than the tests which concern themselves with surgical physiology.

The chief uses of these ureteric catheter tests are in considering nephrectomy in cases of tuberculosis, neoplasm, stone, and hydronephrosis. If both kidneys are diseased (e.g., in tuberculosis), then the blood-urea test may be expected to warn us of this in cases of doubt. This is a fact well worth remembering.

Finally, I would rather put my trust in the indigo test than in all the other tests put together. It can be employed by the surgeon himself at the beside and is therefore superior to any laboratory test. I have used it for 15 years, and can recall only two or three instances in which it has failed me. Those were in cases of pyonephrosis on one side, where an alkaline-infected urine was also coming from the opposite kidney. In such cases the indigo may become decolorised in its passage through this infected kidney. Of course, I am excluding instances where the dye has not been injected properly into a muscle, or has not been properly prepared for injection—accidents that may happen unless the surgeon prepares and makes the injection himself.

Medical Aspects.

I would like to touch upon one or two points as regards these tests when applied to so-called medical cases. Many tests which act satisfactorily in surgical cases do not necessarily act at all in cases of medical nephritis, especially in parenchymatous nephritis, where the diseased kidneys appear to let through almost everything but the chlorides. The lack of correlation between damage to structure and damage to function has to be remembered in this connexion. Surgery is richer than medicine in the possession of evidence of damage to structure that can supplement the evidence of damage to function. In distinguishing between cardiac and renal disease the tests may be found to play a useful rôle. But in laying the foundation for prognosis in medical cases I believe from experience that careful studies of the blood pressure will be found of great value, combined with estimations of the blood urea and with the urea-concentration test.

Conclusions.

Ideal tests of renal efficiency should be as simple as possible, and such as can be carried out by the clinician himself. All tests should be put to the most searching scrutiny in combined work between the clinician and the laboratory worker. But in the end those should be chiefly adopted in practice which are found to be most accurate, and, above all, which should be capable of use by the clinician alone. That is why I prefer the dye tests to the diastase or the urea-concentration test. Tests should be proved in the

laboratory and then be put on the clinical market. You cannot in practice apply all possible tests to all cases, but you must know and practise a few good tests for routine use. I consider the indigo-carmine test the test par excellence; and in surgery I believe that two classes of tests will survive the probation of time and experience—namely, the dye tests (indigo and phthalein), and the blood-urea and urea-concentration tests for prostatic and doubtful bilateral kidney disease.

Finally, no surgeon should operate on kidneys and prostates who has not had a good clinical training in the use of tests of renal efficiency. The risks taken even to-day by general surgeons who operate on such cases appal surgeons who have trained themselves in modern urological methods.

A CASE OF
LARGE URACHAL CYST,
NOT COMMUNICATING WITH THE BLADDER.*

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THE possible persistence in the urachus of allantoic remains is well enough known. It is met with in infancy as one of the forms of umbilical fistula, which may be "blind," or may be in communication with the urinary bladder. Another form of the abnormality sometimes seen post mortem is a nipple- or finger-like protrusion at the apex of the bladder. In a case[1] of this sort a calculus may form and project into the cavity of the bladder; but the occurrence of the protrusion seems frequently unaccompanied by any clinical manifestations. The formation of a cyst may take place in the case of a protrusion having a very small communication with the bladder cavity; or, as in the case now reported, without any communication at all with that viscus.

This striking example of a cyst of the urachus was obtained from a farmer, aged 50, who consulted me in September, 1921, on account of an abdominal tumour of about two years' known duration.

History.—His symptoms began two or three years previously as a sensation of tightness across the abdomen; later he experienced a feeling as of a heavy, "stone-like" weight in the right side. At this time his mouth used to run with water every day for two or three minutes, and this gave temporary relief from the feeling of weight in the right side. His appetite was good, and his bowels fairly regular. With his hands he could feel in the lower abdomen a swelling which gurgled on pressure. He had some delay in micturition.

On Examination.—Patient distinctly spare, but healthy-looking. Lying on couch he presented in hypogastrium a visible bulge, cystic, dull on percussion, and freely mobile. Its mobility from side to side negatived my first impression that it was a distended bladder. No evidence of ascites; digital examination of rectum negative. The condition was looked upon as a tumour of the bladder, possibly malignant.

Operation.—Laparotomy was performed. When the patient had been anæsthetised, a catheter was passed with negative result. Transverse incision across the recti showed a large cyst filling up the pelvis and seated on the apex of the bladder. There were no adhesions, but the cyst could not easily be raised; it was dislodged only after a vertical incision down through the linea alba towards the pubes. The peritoneum was then cut across behind the pubes, and the extraperitoneal cyst was separated from the bladder wall after tying some large vessels passing to it from that organ. Its attachment to the bladder was very close, and great care was required in separating it from the vesical muscular coat. This was successfully accomplished without opening into the cavity of the bladder. The irregular wound of the peritoneum over the summit of the bladder was closed with difficulty, and the closure of the parietal peritoneum also was a little difficult; the other layers of the abdominal wall came together with ease.

Except that for the first week he required the catheter on account of retention, his recovery was uneventful, and he was discharged from the nursing home on the fourteenth day after the operation.

The cyst was oval in outline, measuring 13 cm. by 9 cm., and its long axis was horizontal. It was completely invested by peritoneum, save at the area of its attachment to the bladder. Its contents were a clear, colourless, watery, and odourless fluid, having a specific gravity of below 1010. It was examined by Mr. J. M. Johnston, who reported that it was faintly alkaline and non-albuminous, and gave a marked effervescence with sodium hypobromite. Its reaction to Fehling's solution was doubtful; HNO_3 brought down crystals of nitrate of urea; feathery crystals of phosphates were also obtained.

Histological Examination.—This examination of the cyst wall was made by Dr. A. S. Strachan, who showed it to consist almost entirely of fibrous tissue, with one or two intermingling strands of muscle fibre.

Remarks.

The literature, while perhaps not extensive, shows that considerable attention has been paid to the subject of urachal cysts. A very excellent paper was written in 1906 by Weiser,[2] and he refers to the analysis by Wutz,[3] in 1883, of cases reported up till that time. Weiser tabulates no fewer than 58 cases in the literature between 1873 and 1904, and 28 additional cases communicated to him by personal letter; and he himself publishes three, making 89 in all. His conclusions are that cysts are more common between the ages of 20 and 40 years. Under 15 years of age males and females are affected equally; in adult life females preponderate. In addition to the local signs of swelling the symptoms usually present are "a feeling of illness, loss of flesh, pain, often fever, gastric disturbance, and indeed the appearance of a tubercular subject" (loc. cit., p. 551). In a large proportion of these cases the cyst cannot be extirpated, on account of its relationships and adhesions to neighbouring viscera. In such cases irrigation and drainage have been resorted to with favourable results. Three years later, Doran [4] furnished a very good general account, with many bibliographical references. He refers to the microscopical characters of the urachus, and points out that if the cyst attains a considerable size the wall is correspondingly thinned out and loses some of the characteristic features of the urachal tube. (This, it may be observed, is common to large cysts of other regions and origins.) In default of characteristic histological features, however, Weiser (loc. cit.) considers that the extraperitoneal situation of the cyst, together with its attachment to the bladder, "makes the diagnosis conclusive." The unsuspected presence of a urachal cyst may have an important bearing on operative surgery. This is illustrated by a case reported in 1907 by Balfour Marshall,[5] in which during the performance of a laparotomy an unrecognised cyst was opened, and as it communicated with the bladder the escape of urine suggested at first that that viscus had been wounded. Again, it is evident that the incising of a closed cyst might mislead the operator into thinking that he had entered the peritoneal cavity. In such a case he might reasonably feel temporarily confused.

In the case here reported the points to be noted are the history of digestive disturbance as evidenced by sialorrhœa relieving the feeling of weight; the very spare condition of the patient; and the slowness of micturition. As regards the cyst itself, although of large size, it had not formed any troublesome relationships with or attachments to any of the neighbouring viscera. Removal was therefore not only possible but comparatively easy.

Another interesting point is that, without there being any communication with the interior of the bladder, the fluid contained urea. The difficulty in bringing together at the close of the operation the irregularly divided peritoneum has been noted by other operators.

References.—1. Dykes, C.: THE LANCET, 1910, vol. i., p. 566. 2. Weiser: Annals of Surgery, vol. xliv., 1906, p. 529. 3. Wutz: Virchow's Archiv, vol. xcii., 1883, p. 387. 4. Doran, A. H. G.: THE LANCET, 1909, vol. i., p. 1301. 5. Marshall, G. Balfour: Jour. Obstet. and Gynæc., 1907, vol. ii., 259.

* Communication to Royal Medico-Chirurgical Society of Glasgow.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

THE SURGICAL TREATMENT OF CHOLELITHIASIS:

CHOLECYSTECTOMY AND CHOLEDOCHOTOMY.

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EIGHT years ago I invited attention to this matter. "After considerable experience in biliary surgery I have been forced to the conclusion that nothing short of cholecystectomy effects permanent cure in the great majority of cases commonly known as attacks of gall-stones." This statement was made at the time in opposition to the assertion in Keen's "Newest Surgery," "The danger of re-formation of gall-stones after cholecystostomy is exceedingly small." Since my original communication was published,[1] the more I see of this malady the more convinced do I feel that the opinion therein expressed was correct. I here present a method of cholecystectomy, simple in execution, which admits of operative rapidity[2] in a zone where indecisive manipulation is likely to wind the patient, which reduces hæmorrhage to a minimum, and which, from start to finish, gives the operator mastery of the situation.

Method.

1. Ether by open method: patient in Robson position; skin disinfected with perchloride of mercury.[3]
2. A 5-inch vertical incision in the right semilunar line.
3. Careful examination of the local condition, including palpation of the common duct between the right thumb and the right index finger introduced into the foramen of Winslow.
4. Isolation of the whole operative area by towels and bibules—every visible peritoneal corner being stuffed to prevent subsequent contamination of the general cavity.
5. Two large retractors held by assistants maintain patency of the parietal wound.
6. Application of two strong pressure forceps, about 1 inch apart, to summit of gall-bladder; these are respectively handed to the assistants, who make gentle opposing downward and forward traction.
7. Light incision of serous line of adhesion of gall-bag to liver.
8. Gentle rolling with a large bibule rolled up to about the size of a finger frees the vesicle, in a few moments, from the fossa fellea, without any laceration of liver, and consequently with trivial bleeding; if tough strands of tissue resist they are snipped through with scissors, and complete separation is carried right down to the level of the cystic duct. I know of no infected internal organ which may more easily be enticed from its normal habitat than a tense inflamed gall-bag.
9. With a kidney basin in position—the portion of gall-bag grasped between the forceps is freely opened by a stroke of the knife, and the contents evacuated.
10. This opening is extended, above and below, to within half an inch of the orifice of the cystic duct; the angles are instantly caught in pressure forceps, and if the cystic artery spurts it is seized and ligated.
11. The four forceps—i.e., the two originally applied to base and the two to deep angles of incision in gall-bag—are grasped in the palm of left hand, and with the tip of the left index finger fixed in the cystic cone; outward tension is made while the operator's right fingers make a final palpation of the ducts.
12. If a calculus is met with in cystic duct, it is usually extruded by finger pressure through the cystic orifice; if this fails a spoon or forceps is employed.
13. If a gall-stone is found in the common duct I pass round to the patient's left side and the assistant on the right takes hold of the four forceps and makes outward traction on the gall-bladder while I insert my left index finger (supinated) into the foramen of Winslow; when the calculus is definitely located it is pushed forwards and firmly secured in situ (by forward pressure of left finger), while I make a direct incision over it; when the stone is removed a search is made for others, which, if discovered, are kneaded out by fingers through the same opening. I have abandoned the use of sutures to close the wound in common duct, as I find that drainage is beneficial in such cases, and the wound generally closes spontaneously within a few weeks.
14. I then resume my position on the right side of the table, take hold of the four forceps in left palm, and re-insert left index finger-tip into the cystic pelvis—the assistant on the left applies a stout ligature around the cystic duct. Just beneath my finger-tip the two "flaps" of gall-bladder are cut away with a scissors and stump allowed to recede. Catgut is used for ligation in presence of sepsis, otherwise I prefer silk. If there exists a suspicion of infective cholangitis or septicæmia, and the common duct has not been opened, the two flaps of the vesicle are snipped across close to the orifice of the cystic duct, artery ligated, and drainage provided.
15. Thorough mopping and drying of "the pit" follows—all packing removed—and by aid of retractors a thorough inspection is made of the raw vesicular space. If no oozing of blood is visible the parietal wound is closed by through-and-through silk sutures; if oozing persists, after temporary plugging, one end of a wisp (20 strands doubled and tied with silk at each end) of silkworm-gut is placed alongside the stump of gall-bladder and the other end extruded through the upper angle of the parietal wound. And in case of any bleeding of consequence—two large rolls of dry gauze are packed into the fossa fellea and ends of same similarly brought out through the upper angle of external wound. If mucus or pus has been encountered during the operation drainage is always adopted and silkworm-gut employed for the through-and-through closure sutures. As mentioned elsewhere,[4] I invariably use unabsorbable through-and-through sutures for closure of wounds above the level of the umbilicus, and absorbable tier sutures below.
16. If any sign of collapse is observed during operation a pint of champagne is syphoned into the rectum before removal from table, and when the patient is returned to bed the electric heating cage is promptly applied, continuous subcutaneous serum drip started, hypodermic injection of digitalin and strychnine given every six hours, with as much iced champagne, brandy and soda, or "citrate" water as the patient wishes to partake of. All cases of septic poisoning are treated in "the continuous outdoor."
17. The drain is removed on the third or fourth day, the sutures by the fourteenth, and if the patient is fit he is allowed out of bed on the latter date.

In conclusion I know of no method of treatment for any infective abdominal lesion which is attended with more permanent satisfactory results.

[1] THE LANCET, 1913, ii., 863.
[2] Operating to the Clock, Brit. Med. Jour., 1918, ii., 685.
[3] Skin Asepsis in Surgery, Annals of Surgery, April, 1918.

A CASE OF CARCINOMA OF THE LUNG OF UNUSUAL DURATION.

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THE case described appears to be of interest from two points of view: first, the length of the history—four years from the first symptom—demands attention; the course of mediastinal and pulmonary neoplasm seldom exceeds one year, and 18 months is a long history. Secondly, the facts that the man had been under the observation of so many physicians at hospital and elsewhere, that the diagnosis of tuberculosis was allowed to rest, and that a diagnosis of neoplasm was apparently not entertained. I think it may be said that the larger number—or, in any case, a large proportion—of cases of pulmonary and mediastinal new growth are sent to the hospital with the diagnosis of tuberculosis; it should be borne in mind that the condition, though infrequent as compared with tuberculosis, is by no means a rarity. If cases which presented anomalous signs, and which, whilst having considerable signs and symptoms consistently show an absence of T.B. in the sputum or other variation in the signs to be expected in a tuberculous case, were reviewed in this light mistakes would less often occur. In those rare cases in which tuberculosis and carcinoma are both present the diagnosis must naturally remain obscure.

In the case quoted the continuous hæmorrhage could scarcely have arisen in any other way than from a continued invasion of lung tissue by growth; in

[4] Two Years Operating to the Clock, Bt. Med. Jour., 1914, i., 231.

the nature of things it is not likely in a condition of tuberculosis or fibrosis that the hæmorrhage would have been so continuous and one would expect to have prolonged periods of cessation.

History.—A. W., aged 43. Previous history uneventful, except for pneumonia and pleurisy in 1906. In December, 1917, whilst in the army, he began to spit small quantities of blood, and about this time noticed a pain in the left side on shouldering his rifle; there appear to have been no other symptoms. He was admitted to a military hospital, he had no temperature and no tubercle bacilli in sputum, and was discharged from the army in July, 1918, with the diagnosis of pulmonary hæmorrhage and debility, the hæmoptysis having continued. In the same month he was seen at a tuberculosis dispensary; T.B. absent, no rise of temperature. General condition fair, slight paravertebral dullness and impairment of note at both bases with diminished fremitus and resonance.

X ray examination at this time revealed air-entry poor at left apex, which fails to light up on inspiration. Thickening at roots of both lungs and along bronchus to right lowest lobe, where there is a definitely thickened area; thickening more extensive still at left root and towards left base. Diaphragmatic movement good and equal.

Diagnosis.—He was diagnosed as pulmonary tuberculosis and sent to a chest hospital, and from there to sanatoriums. He remained at the first sanatorium one month: Afebrile; T.B., 0; weight, 10 st.–10 st. 6 lb. Later he was sent to another for a month with an increase of weight to 11 st. 11 lb.

He first came under my care in December, 1919, two years after his first symptom; during the whole of this period he had, on and off, been spitting bloody sputum.

Examination.—Height, circa 5 ft. 2 in.; weight, 11 st. A pale rather sallow man of fair nutrition, complaining of constant hæmoptysis and slight shortness of breath. He brought with him a jar containing several ounces of hæmorrhagic sputum of rather a dark colour. Dyspnœa not marked. There are no signs of intra-thoracic pressure, neither does he complain much of the cough; but he has some pain on coughing, especially in the left side. Tongue coated and flabby; he has few teeth, with some pyorrhœa and fairly severe nasal obstruction. Slight clubbing of the fingers of both hands. No enlarged glands. The apex of the heart is in the nipple line; the percussion note is impaired over the whole chest and is dull at both bases, especially the left; over the left base the breath sounds are absent; V.F. and V.R. almost absent. I made a note to the effect that apart from the length of history this case would appear to be neoplasm of lung.

He ceased attending, and appeared again in August, 1920, having been in a general hospital for nasal and dental treatment. At this time I took him into the City of London Hospital for observation. His physical signs were as before: Temperature, normal; T.B., 0; hæmorrhagic sputum, about one ounce daily.

Radiographic Examination.—Dr. Dudley Stone reported on his radiographic examination as follows:—

> Screen. Fairly defined semicircular shadow to left side of heart. Posterior mediastinum opaque, except for a small area at lower margin and below clavicle. Left diaphragm excursion diminished, heart not displaced. Plate confirms. Left hilus enlarged and calcareous glands. Shadows in left lung have fairly sharp margins and merge into each other and into the heart shadow and are presumably continuous with those seen in mediastinum. The appearances suggest a new growth; well-defined margin indicates slow growth.

Course of Case.—He was diagnosed as "new growth" and discharged. The facts that his pension for pulmonary tuberculosis was stopped, and that somewhat later he was admitted to another general hospital, where he was told that he had no growth, put me so much out of favour that I did not see him again till July, 1921. His physical signs were much the same, he had lost six pounds in weight and looked more cachectic. He slowly became worse and was admitted to St. Columba's Hospital in December, 1921, four years after the first onset of his symptoms. I did not hear of his death in time to be present at the autopsy, and am indebted to Dr. Clark Wilson, visiting physician at the hospital, and to Dr. Herbert Dixon, pathologist, for the following particulars:—

> "On admission the man was very wasted and cachectic and was regarded as a case of malignant disease of lung. At the post-mortem the organs were generally healthy except the kidneys, which were somewhat enlarged and the left one congested. Right lung partly adherent at base and lower lobe showing a fibrotic condition, but nothing like T.B. or growth. The left lung contained a breaking-down mass of growth involving the lung tissues to the size of a tennis-ball, along the fifth, sixth, and seventh dorsal vertebræ and for 2 to 4 inches on the corresponding ribs. There was a small secondary deposit in the left auricle."

A CASE OF
ECTOPIC GESTATION COMPLICATED BY SUPPURATIVE APPENDICITIS.

By MURIEL E. LANDAU, M.D. LOND., F.R.C.S. ENG.,
ASSISTANT SURGEON TO THE ELIZABETH GARRETT ANDERSON HOSPITAL, EUSTON-ROAD, LONDON.

THE following case is, to my knowledge, unique.

Mrs. E. O., aged 40, on Jan. 12th, 1922, complained of pain in the right groin, headache, and cough. There was constipation of one day's duration; no vomiting. The last menstruation had occurred a fortnight previously and was normal. The patient had had two pregnancies—a live child 15 years ago, and six years ago a carneous mole.

Abdominal examination at the onset of the illness revealed nothing abnormal. The temperature was 99° F., pulse 84. There was some bronchitis. Two days later slight bleeding from the uterus began; on vaginal examination a small non-tender swelling was felt behind the uterus. During the next three days, except for a nocturnal rise of temp. of 99°–100°, there was no change. The bowels acted every day.

I first saw the patient on Jan. 18th. Her general condition was good; temperature 99°, pulse 104; tongue white-furred and moist. Abdomen a little fuller than normal, moving well. Deep in the right iliac fossa a tender swelling could be felt rising out of the pelvis; per vaginam a hard, tender, irregular swelling was felt behind and to the right of the uterus. The body of the uterus was a little enlarged, the cervix closed, and not softened. The left fornix was clear. There was blood on the examining finger. Per rectum the same swelling was felt. A diagnosis of right ectopic gestation was made, and the possibility of appendicitis considered. Some hours later I opened the abdomen. The uterus was displaced towards the left by a swelling on its right. This swelling was roofed in by two coils of small intestine and omentum. The intestines were packed off with gauze mattresses and the separation of adherent bowel begun. During these manipulations foul-smelling pus escaped from the swelling. It was mopped away, and the true condition of affairs disclosed—viz., the appendix lying in an abscess cavity behind and below the right Fallopian tube, the isthmial portion of which was dark red in colour, enlarged to a diameter of nearly 2 inches, and occupied by a mole. The appendix was ligated at its base and removed, and the stump buried in the usual way. The infundibulo-pelvic ligament was then secured. It was impossible to ligate the tube proximal to the sac, which was incorporated with the body of the uterus. The outer portion of the tube was removed and the sac cut away from the uterus, on the back of which the raw area was closed by mattress sutures of catgut. The left-sided appendages were normal. The abdomen was then closed, a drainage-tube being inserted through the lower end of the wound into the abscess cavity.

Recovery was uninterrupted. Bowels acted on second day; temperature and pulse became normal on third day after operation. The tube was removed at end of a week.

The points of interest in this case are:—

(1) The simultaneous occurrence of two acute abdominal conditions apparently entirely independent of each other. The question as to which was the primary lesion is obscure. Probably the ectopic gestation was of longer standing than the appendicitis, the symptoms being latent until the superimposed appendicular inflammation hastened changes in the gestation sac, with the result that uterine bleeding began. The left tube appeared to be healthy, and in accordance with the bilateral tendency of salpingo-oöphoritis it is reasonable to assume that the right tube was free from any old-standing inflammation, and the infection of the appendix was not secondary to any tubal condition.

(2) The difficulty in diagnosis of tender swellings in the right side of the pelvis associated with a mild pyrexia. In this case the diagnosis lay between ectopic gestation, salpingo-oöphoritis, and appendicitis. The absence of nausea, vomiting, and abdominal rigidity seemed to negative the diagnosis of appendicitis, although the pelvic type of appendicitis is often atypical in its signs and symptoms. The irregularly intermittent temperature and low situation of the pain were in favour of salpingo-oöphoritis, against this being the absence of purulent vaginal discharge and the unilateral condition present. The slight hypogastric distension which occurred indicated a pelvic peritonitis which might have been due to any of above conditions. The diagnosis of ectopic gestation was made in view of activity of breasts and uterine bleeding.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF PSYCHIATRY.

A MEETING of this section of the Royal Society of Medicine was held on April 11th, Dr. BEDFORD PIERCE, the President, occupying the chair.

RECOVERY FROM MENTAL DISORDER.

The PRESIDENT read a paper on Recovery from Mental Disorder. He chose the subject in the hope that discussion might throw light on causation of mental illness. The term was not easy to define; it scarcely meant the eradication of morbid tendencies; rather was it the restoration or renewal of a state of harmony with surroundings. He limited the term in this paper to the recovery of mental power to such a degree that a person, though far from well physically, might be said to have regained his mental balance. He once sanctioned the discharge of a patient who was dying from a bodily disease because he had recovered from his acute delirium and could understand his position, and expressed the desire to be a voluntary patient. The restoration from insanity to sanity was a wonderful process, and in the routine of a mental hospital its great import was apt not to be fully grasped; certainly such a momentous event deserved the most searching study. If the process could be understood, there was hope of being able to reproduce it in other cases; even the prevention of mental disorder might be achieved. Frequently the physician did not know why the patient got well; mostly patients themselves could give no clue. Recently a highly intelligent young lady who had been violent and subject to acute hallucinations suddenly improved, and in 12 hours the condition had disappeared. She could remember her symptoms and what she had thought and feared, but could suggest no explanation of the change. She had had prolonged baths, but these could hardly be regarded as having any specific remedial effect.

Recovery from mental disease is sometimes so amazing and so little understood that to some it may seem incapable of explanation without calling in supernatural agencies. The modern revival of the doctrine of demoniacal possession, the belief that insanity could be cured by "casting out devils," encouraged in certain quarters, was deplorably retrograde, and did much harm. It re-established the notion that mental disease carried with it a stigma. For that reason alone it was important to search out the physiological and psychological processes which produced recovery.

Five Groups of Cases.

His colleagues at The Retreat, Dr. H. J. Mackenzie and Dr. Marguerite Wilson, had assisted him in reviewing the recoveries which occurred there from 1908 to 1920. Only new cases, those without a history of previous attack, were considered, and those who had sufficiently recovered to resume their normal places in life. The series consisted of 120 patients, suffering from all kinds of psychoses. Some might well have been voluntary patients, had they been fit for treatment in that capacity; hence most of them could be regarded as not coöperating in their treatment. Dr. Pierce divided the cases into five groups. The first contained 21 patients who subsequently relapsed; the second, 27 cases in which the cause of recovery was obscure; the third, 20 obscure cases in which heredity was perhaps an important factor; the fourth, 33 cases in which recovery appeared to depend on removal of physical disability; the fifth, 19 cases in which recovery arose chiefly through adjustment of mental stress, and was therefore psychical. In 49 per cent. of the cases there was a history of mental illness in the family.

Most of the cases in the first group, Dr. Pierce said, never recovered from the second attack. The 27 in Group 2 (12 males, 15 females) had not relapsed, but it was very difficult to know exactly why they recovered. It is remarkable how soon after admission convalescence begins in some cases with a long history. It was quite unsafe to assume that a case with a short history would recover soon, and that one with a long history would make a slow recovery. Dr. Pierce believed that when a state of mania has been established it might, under unfavourable conditions, go on indefinitely, but when a change of surroundings is made recovery becomes possible.

With regard to the 20 cases in Group 3, little was known of the reasons for their recovery; in these there was a history of insane inheritance. One case went home without leave, and from that time began to recover; she had remained well eight years. The fourth group, the largest, consisted of those with definite physical disorder, some kind of toxic condition being apparently responsible for the mental illness. In this category there were 8 men and 25 women. Alcohol, drugs, or other sedatives were responsible in 10 cases, the puerperium in 8, post-operative troubles in 4, influenza in 4, while included in the remainder were such conditions as thyroid insufficiency, encephalitis lethargica, and diabetes. It was safe to say that in all these cases the mental recovery depended on the restoration of bodily health. Most were confusional cases of short duration. In some of the patients, psychogenic factors were probably of equal importance; in some there was inherited weakness. Dr. Pierce narrated some interesting cases in the group; in one case at least five causal factors contributed to the illness.

The Damage Done by Sedative Drugs.

In this connexion he had a word to say as to the part played by a sedative drug. His rule was never to give sedatives for restlessness and excitement; indeed, he regarded their use as a confession of failure. It was only when a patient began to show objective signs of wear and tear that he gave them a trial. Certainly little good would be done with a new case until the drugs given before admission had been eliminated. Frequently, in his view, the giving of sedative drugs hindered the natural processes of repair. In 10 or 12 cases he had seen striking benefit from sulphonal given regularly during several successive days; but this was exceptional.

In referring to toxic cases attention was drawn to the fact that the mental disturbance lasts long after the original cause has disappeared. It is evident there is some other factor than the infection or other source of poison. Lewis Bruce had demonstrated that an increase in the number of leucocytes preceded convalescence, and persisted long after it had become established. Very probably the original toxic agent initiates secondary changes of a more resistant nature. In Dr. Pierce's experience treatment of these cases by vaccine therapy had been singularly unsuccessful.

The last group consisted of patients whose recovery seemed to depend on removal of mental strain, or a new adaptation to the circumstances of life. The causal factors in these were mainly psychogenic, and their illness could be regarded as an escape from an intolerable position. In the majority the psychosis was maniacal in character, in some it was almost a delirium. There was no formal treatment by analysis; indeed, most of the patients recovered before much headway could have been made with psycho-analysis. But in every case there were a number of intimate discussions upon the difficulties presented, and these paved the way for the reconstruction of outlook. The removal from home, the introduction to a totally new social life, the opportunity for frank discussion of troubles, regular routine with attention to general health: these do much; but in many cases a considerable interval of time was essential before it was possible to build afresh on shattered hopes, or resume former duties and interests.

Recovery Following Removal of Toxæmia.

Proceeding to review the question of recovery from mental illness, Dr. Bedford Pierce said he inclined to

the view that in the great majority of cases it was due to the removal of a toxæmia by the recuperative processes inherent in the organism; apparently the cellular elements automatically liberated the defensive products which destroyed and led to the excretion of the noxious substances. It had been said that alcoholic delirium was not due directly to the alcohol, but depended on an excess of unidentified bodies produced by the tissues in defence. Similarly, Dr. Pierce thought mental confusion might depend on secondary products, not directly on influenza or other septic invasion. Recovery, therefore, might be a matter of combating these secondary effects. Even when there was a psychogenic cause, such as bereavement, there might also be an induced toxæmia, or a disturbed balance of internal secretion. In treatment no aspect of the subject could be ignored. Probably no mental disease owned a single cause, and recovery was seldom due to any single line of attack. In psychiatry the physician must be eclectic in his methods, must keep an open mind, and, above all, refrain from identifying himself with any exclusive method of treatment. Prominent among his rewards was the pleasure of seeing his patients recover and resume their place in society. Though sometimes he was not sure how this happened, it was a joy to have been able to assist, even to a small degree, in bringing about this happy result.

Discussion.

Sir ROBERT ARMSTRONG-JONES did not agree with the description of insanity as a withdrawal or retreat from some intolerable situation; the patient did not know what he was trying to escape from, and he lacked an insight into his own condition. During the 25 years he was at Claybury Asylum, the recovery-rate was 33 per cent., and the average yearly relapses were 12 per cent. He agreed that long-standing cases sometimes recovered on being transferred to another institution, and there might be a good deal in the changed personal relationships which Dr. Bedford Pierce spoke of. He did not regard favourably sudden conversions or recoveries; he had seen patients recover suddenly within a week, keep well for a month, then suffer an acute relapse. After much observation he had come to the conclusion that cases in which heredity played a part were more recoverable than those in which that factor was absent. He concluded by referring to a class of case, resembling general paralysis, in which the blood (as opposed to the cerebro-spinal fluid) gave a positive Wassermann reaction; these cases would probably benefit by intensive anti-syphilitic treatment.

Dr. C. HUBERT BOND said the admirable contribution of Dr. Bedford Pierce encouraged him—and he could say the same for his colleagues on the Board of Control—in the belief that they were quite right in the decision they came to some months ago, with some diffidence, to take up this question of recoveries with any resources that might be available; it had never been systematically done. They resolved to ask the staffs of mental hospitals to supply copies of the recovery registers, in the same way that, for many years, copies of the admission registers had been sent. They decided to ask this because they attached great importance to what might be gathered from a tabulation of facts and a careful consideration of the mass results. He referred to the calumnious statements still being made in reference to mental hospitals, and the almost triumphant remarks as to lack of adequate recovery-rates in them. Of about 22,000 admissions into institutions for the insane the recovery-rate was 35 per cent. But that figure was arrived at by including every case which came into the mental hospital. A fairer gauge of results would be arrived at by a number of quite justifiable eliminations, such as pronounced organic cases, senile dementias (to be distinguished from psychoses in senility), congenital cases which were either in a state of idiocy or imbecility, and congenital mental defect and general paralysis. If that were done, the 22,000 cases would show a recovery-rate of 49 per cent. But there remained 37 per cent. of cases which, for all one knew, might just as well recover but did not, and none could rightly say why. Everything pointed to there being great need for routine methods of inquiry. Inquiry must be pursued along the psychogenetic line, by having a much larger number of well-trained medical officers, suitably paid, and more routine laboratory investigation.

Dr. STANFORD READ pointed out that the conception of recovery hinged much on whether one looked at the condition from the scientific side or from that of conformation to the requirements of society. Though superficially, in conversation, a person might seem to have regained his sense of fitness and proportion in the world in relation to himself, psychological investigation might reveal certain definite defects. Progress in knowledge as to the mechanism and reasons of recovery could only be made by a wider and more intensive study of individual cases; this was scarcely possible in institutions, on account of the great amount of time required and the extent of each medical officer's duties.

Dr. J. BEATON agreed as to the small amount of knowledge we possessed as to why recoveries took place. It was very difficult for the ordinary person to understand his own mental processes. He remarked on the fact that a patient who had been constantly wishing to return home would cease these requests with the advent of convalescence, showing a remarkable submissiveness and lack of initiative. Dr. Lovell had shown that in certain cases of stupor there was a definite increase in the surface tension of the blood serum, a discovery which might have important bearings. In opposition to the President, he regarded sedative drugs as very valuable, and gave a striking case in illustration of this contention.

Dr. NORMAN pointed out the difficulty of drawing reliable conclusions from statistics which depended on personal diagnosis, and whose value might be reduced by the possibility of relapses. In some conditions, though at a certain period practical recovery had occurred, it could be prophesied that eventually there would be an inevitable breakdown. He agreed with Dr. Beaton as to the value of sedatives in mental conditions, though their employment might be abused. Given in sufficient doses they were of definite use. Some gave sulphonal or paraldehyde in such small doses that the patient got into a more or less dazed state, and became more instead of less irritable. By producing stupor the excited cells might be given rest, cells of lower range brought into action, and so recovery be aided.

The PRESIDENT, in the course of a brief reply, said that had there been time, he would have liked to justify his attitude about sedative drugs; he had seen many cases in which they undoubtedly did harm. There was, moreover, a theoretical objection to their use in that it may be assumed they retarded protoplasmic activity and delayed repair.

NORWICH MEDICO-CHIRURGICAL SOCIETY.

A MEETING of this Society was held on April 4th, Dr. WILLIAM WYLLYS, the President, occupying the chair.

Mr. A. J. WALTON (London) delivered an address on the

Surgery of the Pituitary Gland.

He first touched on some points in the anatomy of the pituitary gland and fossa, showing how the gland is surrounded by a complete network of blood-vessels, and in intimate relation to the optic nerve and tract, the cavernous sinus, internal carotid artery, the third and fourth nerves, and the three divisions of the fifth. This intimate relation explained the pressure symptoms due to enlargement of the pituitary, and also showed the difficulty in getting at the gland from below. Mr. Walton dealt briefly with the functions of both lobes of the pituitary gland, and pointed out that

although the chief function of the posterior lobe was its pressor effect, yet there was a secondary depressor effect, and that therefore administration of pituitrin was not entirely without danger. He detailed the various changes which occurred in the metabolism of the body from affections of the anterior and posterior lobes of the pituitary gland. It had been stated by many authorities that it was fatal to remove the entire gland, but this was not his experience; he had several times removed the whole gland with good effects. With regard to the indications for operation, it was usually laid down that these were the cardinal signs of cerebral pressure—viz., headache, vomiting, and optic neuritis—but if the operation was to be successful it must be undertaken before the onset of these signs. Important indications for operation were to be found in certain eye symptoms, such as hemianopia, and oculo-motor paralysis from pressure on the third nerve, and diminution of sugar tolerance was another important indication. Mr. Walton showed two patients on whom he had operated for removal of pituitary tumours, and exhibited a number of photographs and charts. He had discarded operation by the nasal route, chiefly on account of the difficulty of reaching the pituitary fossa. He now operated by removing a large skin flap over the frontal bone, raising a portion of the bone, and by this means obtained much easier access to the gland. He always operated on the side on which the patient had the worse sight.

DR. OLIVER SMITH (Gorleston) read a paper on

Parathyroid Disease,

illustrated by three cases of the disease. He said that the physiology of this affection was in a very imperfect condition, but that there were two effects which were constantly noticed—viz., the production of tetany and changes in the calcium metabolism. There was a tendency to confound some of the milder cases with neurasthenia, and he believed that many of his cases which he had formerly considered to be Graves's disease were really cases of parathyroid disease. Dr. Smith indicated four main groups of symptoms characteristic of parathyroid disease: (1) tetany, (2) sensory changes, (3) myasthenia, (4) changes in the nails and hair. In the majority of cases tetany did not occur, but there was a general excitability of the nervous system. The intermittent character of the tetany was brought out by conditions such as pregnancy and influenza. He demonstrated on patients present Trousseau's sign and Chvostek's sign. Sensory changes were nearly always present. Patients complained of various ill-defined pains, usually attributed to neuritis or rheumatism. He demonstrated Hoffmann's sign by pressure on the median or peroneal nerves. Sensations of "pins and needles" were very common. Myasthenia was very characteristic. Patients always complained of a tired feeling in the muscles. Changes in the nails and hair were constant. The normal translucency of the nails was lost; the number of white spots on the nails were increased, and there was a great tendency for the hair to fall out. As to treatment, he had seen some benefit from the exhibition of thyroid extract, and more recently from parathyroid extract, and had observed striking results from the use of calcium chloride in full doses.

FEES PAYABLE TO MEDICAL WITNESSES.—The following resolution was passed at a meeting of the Balham and District Medical Society on April 9th:—

Hearing that legislation relating to inquests is about to be introduced by the Home Office, this Society is of the opinion that a substantial increase in the fees payable to medical witnesses, for making post-mortem examinations or for giving evidence, should be made.

The hon. secretary of the Society points out that the London County Council has power to vary the fees payable to all witnesses or others concerned with inquests, but the fees payable to medical men are fixed by the Act and cannot be varied. Thus it happens that an undertaker now receives as much for removing the body as a medical man for giving evidence as to the cause of death.

Reviews and Notices of Books.

MEDICAL OPHTHALMOLOGY.

By R. FOSTER MOORE, O.B.E., F.R.C.S., Assistant Ophthalmic Surgeon, St. Bartholomew's Hospital; Surgeon Moorfields Eye Hospital. London: J. and A. Churchill. 1922. With 80 illustrations. Pp. 300. 15*s*.

IN these pages, says the author in his preface, an attempt has been made to give a concise account of those pathological conditions of the eyes and their connexions which are of interest in general medical diseases. The attempt is very largely successful, although the account can hardly be said to be complete. However, a book in which the treatment of the subject reveals original thought and in parts original work makes much better reading than a systematic and comprehensive treatise.

In the first chapter certain important ophthalmological signs and symptoms are considered without special reference to the diseases with which they are connected. The latest views on the cortical representation of vision are included, also accounts of the pathogenesis of optic neuritis or papillœdema, as Mr. Moore prefers to call it, and of the different forms of nystagmus. There is an excellent introduction to the subject of retinal hæmorrhage in general. Of Wernicke's pupil reaction Mr. Moore states that clinically he has never been able to reap any advantage from it. The section on indirect paralysis of cranial nerves contains a figure, reproduced from Harvey Cushing, showing how acutely the sixth nerve may be indented when it is crossed at right angles by certain intracranial arteries.

Of the subsequent chapters the most important are concerned with retinal arterio-sclerosis and arterio-sclerotic retinitis. The two conditions run into one another and the second is always preceded by the first, the distinction between them lying in the absence or presence of white spots of exudation in the retina. The condition of arterio-sclerosis in which the rigidity of the retinal arteries is proved by their want of transparency at venous crossings (apparently Mr. Moore allows a slight want of transparency to be normal) and by an alteration in the direction of the artery as it crosses, may persist for years without causing any symptoms. When, however, the case has become one of arterio-sclerotic retinitis it must be regarded as far more serious. Among 66 Moorfields patients followed up by the author there were 35 who had arterio-sclerosis only, and 31 who, in addition, had retinal exudates. An analysis of the two groups showed, as would be expected, that the blood pressure was higher, the incidence of cerebral vascular lesions more frequent, and the mortality greater, in the group in which retinal exudates were present in addition to the vascular disease. Occasionally these cases are complicated by "amaurosis fugax"—paroxysmal attacks of blindness in the affected eyes which may or may not be permanent. When permanent these cases were formerly often attributed to embolism of the central artery, but it is now known that they are generally due to the existence of a narrow lumen caused by disease through which the normal blood pressure is only just able to maintain the circulation; when that pressure falls from any cause the circulation through the affected vessel ceases and there may even occur a permanent thrombosis. Both these conditions—retinal arterio-sclerosis and arterio-sclerotic retinitis—must be distinguished from renal retinitis, and in a further chapter are given some excellent figures of sections showing the pathology of this condition. The well-known fact that the duration of life in these cases (except of those associated with pregnancy when the prognosis is good) is seldom more than two years from the date at which the retinitis is first seen, receives further confirmation from Mr. Moore.

Other subjects fully dealt with include the ophthalmoplegias, encephalitis lethargica, the ocular complica-

tions of pituitary gland and thyroid affections, the toxic amblyopias, and the ocular complications of syphilis. Tuberculous affections are dismissed somewhat lightly without any reference to phlyctenular disease, while the opinion is expressed that the solitary patches of choroiditis sometimes considered tuberculous are more probably due to embolism of a choroidal vessel. We miss any reference to the connexion between iritis and choroiditis on the one hand and septic conditions, more especially dental abscesses, on the other. The omission of rheumatism among the causes of iritis is a proof that the pathology taught is well up to date; moreover, in spite of the authority of the late Sir Jonathan Hutchinson, the author is obviously sceptical as to gout as a cause of eye disease. The existence of any specific diabetic retinitis has recently been doubted, but here Mr. Moore is not among the sceptics; for although these cases often bear a strong resemblance to renal retinitis, he points out that the patches of retinal exudation in diabetes have certain distinctive characters. The connexion between errors of refraction and muscle balance and nervous troubles is hardly touched upon; Mr. Moore holds that in the ætiology of epilepsy and chorea their importance has been much exaggerated. The subject of treatment does not come within the scope of the book, but in one respect Mr. Moore's conclusions will be regarded by ophthalmologists as too sweeping. He maintains that neither mercury nor any of the salvarsan compounds will either prevent the onset or bring about a cure of interstitial keratitis.

The figures in the book are good and its general conception excellent; we may anticipate a long life for it in successive editions.

PASTEUR AND HIS WORK.

By L. DESCOUR. Translated from the French by A. F. and B. H. WEDD. London: T. Fisher Unwin. 1922. Pp. 255. 15*s*.

SOMETHING is wrong with scientific biography if nothing better than this can be made of Pasteur's pilgrimage. Perhaps it is that a life wholly devoted to experimental investigation is too uniform and lacking in incident. But it seems more likely that the author rather than the subject is at fault either in not really appreciating where the hero stood in intellectual history, or in being unable to convey the picture to the reader. Stephen Paget's "Victor Horsley" or Karl Pearson's memoir of W. F. R. Weldon in *Biometrika* are portraits of real people; they may be accurate or not, but at any rate they give a sense of reality. Dr. Descour gives an account of Pasteur's work, precise, orderly, intelligible, but dull and inhuman, and suggesting none of the enthusiasm for further progress which is the essence of good history: tales of the past which have no relation to the future are hardly worth telling. There is, too, very little of Pasteur in the book, and after all he was a human being. The multiplication of partial accounts is unnecessary, and it is difficult to see where the present volume provides anything that is not in Vallery-Radot or Duclaux. However, if anyone wants a straightforward history of Pasteur's scientific work they will get it here; they will read the wonderful tale of the ramifications of crystallography, and understand why the *Journal of Infectious Diseases* has two curious cubes for its sigillum; they will learn how a man who did not know that a moth comes out of a chrysalis (as is told in Fabre's life) could successfully tackle the diseases of silkworms. The translation reads easily enough, and its general reasonableness makes one surprised to see Dr. Wedd perpetrate (p. 66): "Dr. Bastian was a distinguished English physicist, Professor of Anatomical Pathology at University College in London"; one doubts, too, whether "Philomatic Society" (p. 71) and "Sir John Lister" (p. 237) are historically correct.

GYNÆCOLOGY.

The Practical Medicine Series. Gynæcology, Vol. V. Edited by E. C. DUDLEY, A.M., M.D., Professor of Gynæcology, Northwestern Medical School. Obstetrics. Edited by JOSEPH B. DE LEE, A.M., M.D., Professor of Obstetrics, Northwestern Medical School. Series 1921. Chicago: The Year Book Publishers. Pp. 384. $1.75.

THIS year-book contains a large amount of information collected mainly from American sources. It is a pity that the editors, who do not hesitate to express their disapproval of at any rate some of the articles, have not gone further and eliminated many of these altogether. This would have diminished the size of the work and certainly would have added to its value, as there are few gynæcologists or obstetricians of any experience who would not on the whole agree with the criticisms of the editors. If they intended the reader to form his own opinion, without any help, then perhaps it would have been better if they had not expressed their views so freely.

The book is, however, useful within its limitations. The range of extracts from the appropriate literature is very wide but of varying degrees of excellence. Some of the most interesting are those dealing with the modern development of midwifery as it appears to be practised, at any rate, by one obstetrician in Buffalo, who seems to have reduced his practice to the performance of Cæsarean section or delivery by version after full dilatation under anæsthesia. It is difficult to imagine a more typical example of meddlesome midwifery, and we are not surprised to find that his foetal mortality is some 8 per cent. No wonder Dr. De Lee points out that the women of Buffalo are paying too high a price for their relief from the pain of the second stage of labour.

There are many problems in gynæcology for whose solution useful information may be obtained from these pages such as the rôle of the endocrines in gynæcology, the treatment of uterine hæmorrhage, the operative and other methods of treating cancer of the uterus, and the uses of radium. In the second section of the book, some of the more important subjects dealt with are the toxæmias of pregnancy, Cæsarean section, the induction of premature labour, and the uses and abuses of pituitary extract.

The practitioner who reads this book will derive a great deal of instruction, and not a little amusement also from the frank criticisms of the editors.

The Threshold of Motherhood. A Handbook for the Pregnant Woman. By R. DOUGLAS HOWAT, L.R.C.P., L.R.C.S. Edin., L.R.F.P.S. Glasg. Glasgow: Maclehose, Jackson and Co. Pp. 49. 3*s*. 6*d*.

THIS little book has been written for the use of the mother herself, and is intended to explain the various phenomena which occur during the course of a normal pregnancy and those functional disturbances which are most likely to arise. It is written in clear and simple language, and includes not only information on care during pregnancy but also directions for the preparations required before confinement and instructions as to safeguarding the puerperium.

A helpful little work for expectant mothers.

AN INTRODUCTION TO DERMATOLOGY.

Seventh edition. By NORMAN WALKER, LL.D., M.D., F.R.C.P., Physician for Diseases of the Skin, Edinburgh Royal Infirmary. Edinburgh: W. Green and Son. 1922. Pp. 366. 21*s*.

AMONG the smaller text-books of dermatology in the English language, Dr. Walker's "Introduction" has been, perhaps, the most widely read, since it first appeared over 20 years ago. Dr. Walker deserves great credit for having produced an original and thoughtful work free from the stereotyped phrases and useless discussions that detract from the value of many otherwise valuable text-books. We point

out below where we are not wholly in agreement, while we admire the skill which has enabled the author to impart so much information in such an agreeable style and in so small a compass; to have achieved this betokens a wide experience as well as great technical knowledge.

The original edition was written when the dermatological world and Dr. Walker were under the spell of Unna's inspiring but erroneous teaching, and Dr. Walker has not revised the section on seborrhœa. For him seborrhœa is equivalent to pityriasis simplex, or, since he dislikes the word pityriasis, let us say scurf; and he states that "seborrhœa should, I believe, be looked on as a specific form of inflammation of the skin." We cannot see any justification for this nomenclature: the word seborrhœa should be reserved for the state it indicates—namely, excessive secretion from the sebaceous glands; and, although a scurfy head is a common accompaniment of this state, since it predisposes to infection of the skin with the spores of Malassez as well as with bacteria, pityriasis simplex may occur without seborrhœa. Dr. Walker still considers psoriasis as "the extremely dry form of seborrhœa," by which, we understand, he means a dry form of seborrhœic dermatitis. While admitting that cases are met with in which from one examination alone it may be difficult to distinguish between true psoriasis and the psoriasiform type of seborrhœic dermatitis, and that the two conditions may coexist, the arguments against this view are difficult to meet. One of the strongest is that, although the spore of Malassez is constantly present in the scales of pityriasis simplex and in seborrhœic dermatitis, it is not found, as Dr. Whitfield points out, in the scales of psoriasis.

Dr. Walker still holds that alopecia areata is due to an external infection and is contagious; that there is a rare epidemic form of this baldness is, perhaps, proven, but the evidence in favour of an external origin for the disease, as commonly met with, is very slender. As is well known, Dr. Walker is one of those who would abandon the word eczema entirely and substitute the non-committal word dermatitis. The reasons for this are difficult to understand. No dermatologist employs the despised word as defining a disease; it is employed to indicate a certain type of reaction, with definite clinical and histological features, to a variety of irritants of both external and internal origin; the word urticaria is used in the same way, but no one has yet suggested that it should be abolished.

The section on dermatitis venenata is extremely well written and of great interest, but, while we agree that an external cause should always be sought for first in cases of eczema, the influence of internal factors is becoming more and more apparent. We hope that in the next edition a section will be devoted to infantile eczema, a condition which the general practitioner is frequently called upon to treat, and about which he will learn little in the volume before us. Practitioners will, however, appreciate the brief, clear, and practical directions for treatment, and special mention should be made of the coloured plates, of which there are a considerable number. They have been beautifully reproduced, and should be of great help to students attending dermatological clinics.

EPHRAIM MCDOWELL.

Ephraim McDowell, "Father of Ovariotomy" and Founder of Abdominal Surgery. With an Appendix on Jane Todd Crawford. By AUGUST SCHACHNER, M.D., F.A.C.S. London and Philadelphia: J. B. Lippincott Co. 1921. Pp. 331. 25*s*.

HORACE tells us in the Ninth Ode of the Fourth Book that many heroes lived before Agamemnon but are unknown and forgotten for want of a poet to sing their praises. Dr. Schachner has determined that Ephraim McDowell's memory should not fail to be kept green and has taken upon himself the part of the "vates sacer" who should make amends for the indifference with which he considers Ephraim McDowell's labours and acts have been hitherto regarded. In our opinion the indifference to which Dr. Schachner again and again refers is more apparent than real, for we do not think that to-day there is any hesitation in allowing that McDowell really was the first to plan and perform an ovariotomy for ovarian cyst with success.

Dr. Schachner gives an interesting account of McDowell's early life, family and forebears; of his studies in Edinburgh, of his return to Kentucky, of the first ovariotomy and of seven others which he published, making a total of eight cases with only one death. In the eighth case, although the patient recovered, the operation was not completed owing to the tumour having extensive adhesions. The record, however, is sufficiently wonderful, when it is remembered that it is one of the practice of an ordinary country practitioner, with no anæsthetics, with no skilled help and in a very sparsely settled region, where hospitals were unknown as well as trained nurses. The incredulity with which the account of the first operation was received in this country may not have been to the credit of the medical profession, but even unfavourable criticism is better than the studied neglect with which McDowell's countryman, Dr. Samuel Physick, seems to have treated the report of the case. However, all this is ancient history, and McDowell's claim to priority is now universally allowed in so far that he was the first to diagnose and treat upon right surgical principles—i.e., by removal—a cystic tumour of the ovary. The only person who may be said to have preceded McDowell was the sow gelder, who according to John Weyer (1515-88) performed a double ovariotomy upon his own daughter some time in the sixteenth century; anyone who has ever seen an expert sow-gelder at work will not think the story impossible. But even this does not detract from McDowell's credit, in that he was the first to operate upon reasoned scientific grounds. Dr. Schachner also pays a well-deserved tribute to the memory of Jane Todd Crawford, the patient in the first case whose pluck and confidence in the operator were by no means the least part of the foundations of the now mighty edifice of abdominal surgery.

Altogether Dr. Schachner has produced a most interesting work.

AN OUTLINE OF PSYCHOLOGY.

London: The Plebs League. 1921. Pp. 178. 2*s*. 6*d*.

THIS outline, "expounded by revolutionaries for revolutionaries," is for the use of propagandists of Marxian Socialism, and whoever regards such propaganda seriously will be stimulated, pleasantly or painfully, by the ability shown in its compilation. It ranges from the physiology of the central nervous system through the psychology of James, McDougall, and Trotter to the theories of Freud, and the material is presented clearly and accurately. The acceptance of Tridon as an authoritative writer upon psychoanalysis is the only betrayal that the compilers have not an inside acquaintance with the views of actual workers. When they allude to the success of the Russian revolution the anonymous authors evidently mean that it succeeded in being a revolution, and the phrase is characteristic of their extreme views. Characteristic, too, is their statement, supported by United States army tests, that the mental intelligence of the average voter is that of a normal child between 14 and 15 years; an ordinary politician would scarcely dare to draw attention to the fact, but this book is not written to justify views by psychological argument, but to teach psychological principles to propagandists. Since the Marxian material is easily distinguished from the rest, and the book is very cheap, it might be recommended to politicians of all groups; they will find justification in the old tag, *Fas est ab hoste doceri*.

THE FOUNDATIONS OF PSYCHOLOGY.

By JARED SPARKS MOORE, Ph.D., Associate Professor of Philosophy in Western Reserve University. Princetown University Press. 1921. Pp. xix. + 239. 12*s.* 6*d.*

THIS volume is divided into three books, of which the first deals with the definition of psychology and concludes, after 85 pages of discussion, that psychology is "the science of mind." The second discusses the field of scientific psychology, and is concerned first to expound the nature of scientific explanation in general, and secondly to consider the relationship of psychology to the other special sciences. The third book deals with the postulates of psychology, taking these to be (1) the existence of the material world; (2) the existence of consciousness; (3) the inter-relation of consciousness and the material world; (4) the uniformity of mental life. There are two chapters, finally, on the subconscious and the various theories which have been put forward concerning its nature. These topics are all discussed in a portentously solemn manner, and the views advanced are perhaps best described as "highly respectable." The author is better acquainted with American psychology than with work done in other countries. He will have very little to do with any of the newer movements, and where he mentions them it is generally to discover their imperfections. A reader who has a strong bent towards generalities, and whose work in psychology has so far been confined to its more practical aspects, could probably learn much from Prof. Moore's discussions. But there is really no excuse for making any book on psychology quite as dull as this.

DREAMS AND THE UNCONSCIOUS.

An Introduction to the Study of Psycho-Analysis. By C. W. VALENTINE, M.A. Cantab., D.Phil. St. Andrews, Professor of Education in the University of Birmingham. London: Christophers. 1921. Pp. 144. 4*s.* 6*d.*

THE author of this little book, fortified by a knowledge of "orthodox" psychology, approaches psycho-analysis in a critical spirit but without hostility; some of his criticism seems inadequate and psycho-analysts will regard him as over-cautious, but his caution adds value to his positive judgment expressed on page 138, that "at least there is a large element of truth in some of its most important doctrines." Dr. Valentine sometimes offers facile explanations which give a sense of knowledge where none exists, as when he writes (p. 108): "No doubt the curious symbols and cross associations [in dreams] may be partially explained by the unequal degree of resting of the various portions of the brain," and the slight evidence of personal analytical investigation makes one regard the book as a result of study rather than of practice. It is clearly written and should appeal to the reader who seeks an impartial exposition of the subject.

A MANUAL OF SURGERY.

Sixth edition. By ALEXIS THOMSON, F.R.C.S. Edin. and Eng., Professor of Surgery, University of Edinburgh; Surgeon, Edinburgh Royal Infirmary; and ALEXANDER MILES, F.R.C.S. Edin., Surgeon, Edinburgh Royal Infirmary. Oxford Medical Publications. London: Henry Frowde and Hodder and Stoughton. 1921. Vol. I., pp. 659; Vol. II., pp. 565; Vol. III., pp. 564. 12*s.* 6*d.* per volume.

THE sixth edition of this well-known text-book differs in certain important respects from its predecessors. It is now arranged in three volumes instead of two, and although this adds little to the total of pages, it makes for a better division of the subject-matter. The book is brought up to date by the inclusion of such of the lessons of the war as are thought to be of permanent value in civil practice. There has been some rearrangement of the text; for example, the chapter on Deformities now takes its place immediately after those on Injuries and Diseases of Bones and Joints, instead of at the end of the work as hitherto. Many of the old and familiar illustrations are replaced by new ones.

The work, as now thoroughly revised, with its companion manual of Operative Surgery makes an admirable small treatise on surgery, and for the student a concise and comprehensive guide. Even the adoption of the Basle nomenclature does not seem to diminish its popularity, judging by the appearance of successive editions at frequent intervals.

OPERATIVE SURGERY.

By J. SHELTON HORSLEY, M.D., F.A.C.S., Attending Surgeon, St. Elizabeth's Hospital, Richmond, Va. London: Henry Kimpton. 1921. Pp. 721. 52*s.* 6*d.*

IN this book the author has given a record of his personal operative experience. He bases the technique of all operations upon the preservation of physiological function and the interpretation of the biologic processes that follow surgical operations; and no more admirable basis for the elaboration of surgical technique can be imagined.

Considerable space is thus devoted to the suturing of blood-vessels and Mr. Horsley describes at length his technique, explaining the use of a neat arterial suture staff. Though it cannot be said that arterial suture is likely to become very widely practised, yet its importance in certain cases cannot be gainsaid, and this account serves as an excellent guide to its performance. In dealing with nerve suture the actual details of end-to-end suture are well discussed, but no mention is made of various manœuvres to obtain approximation of the ends, and the author proceeds to discuss such procedures as cable grafts, nerve flaps, and end-to-side suturing. Here he departs somewhat from his ideal standard, for surely any procedure which will obtain end-to-end apposition of the cut nerve is more physiological than any flap or graft operation. Mr. Horsley can find no condemnation too strong for metal plates in bone surgery. Though we acknowledge that his arguments are theoretically sound, yet the hard facts of practice tend to show that the metal plate is in the majority of cases a very useful instrument. Intra-medullary bone grafts may be of value, but if so destructive a method as Hogland's is necessary to obtain good results, then for our part we prefer the metal plate. Considerable space is allotted to plastic surgery, and rightly so, for this branch of surgical technique will be utilised more and more by the general surgeon. Operations on the skull, brain, and spine are well described, though rather undue prominence appears to be given to the operative treatment of hydrocephalus, meningoceles, and spina bifida.

There is a certain lack of proportion noticeable in the book, and perhaps this is most amply shown in the section on the neck. Long descriptions of the removal of a thyro-glossal cyst, where a much too severe procedure is recommended, and of complete laryngectomy are given, and such conditions of prime importance to the general surgeon as cervical ribs and pathological conditions of the thyroid are most summarily dealt with. But it is in the discussion and description of amputations that the author disappoints us most. In his preface he denies all intention of including every operation, and proposes to give only those that fit in with his general ideas; yet he describes all the old amputations in the extremities, many of which the war proved entirely impracticable—e.g., Stephen Smith's, Stokes Gritti's, and Carden's operations. Tendon transplantations and graftings, arthrodesis and excision of joints, are all admirably set out, as is Kondoleon's method of dealing with elephantiasis. In the chapter on the breast Dean Lewis's operation as described for duct papilloma seems a most unjustifiable procedure, seeing that the nipple is left, but this is an excellent method of removing a breast which is the seat of

widespread chronic mastitis. With regard to the Rodman operation for carcinoma mammæ, the incisions are such that adequate flaps cannot be turned back, and it seems impracticable for peripheral growths, particularly one in the axillary tail.

Quite the best part of the book is that pertaining to abdominal work. The various operations on the gall-bladder are well described, as is also the transplantation of the common bile-duct into the intestine. The method of Coffey is one which can and should be used on many occasions, such as the implantation of the ureters into the colon, or the placing of a tube into the intestine for drainage. Its fundamental principle is to reproduce as nearly as possible the valve-like opening normally seen at the entrance of the ureter into the bladder. There can be no doubt that the surgery of the stomach in the past has been elaborated with far too small a regard to physiological principles, and it is here that Mr. Horsley has shown how largely his technique has been influenced by such principles. Bowel resection and bowel anastomosis are admirably dealt with; and although many surgeons would not care for an end-to-end anastomosis of small to large intestine, yet the author's ingenious method of an enterostomy so placed that the tube goes through the sutured area most certainly provides a safety valve. With regard to appendicectomy we cannot agree with his opinions on the dangers and disadvantages of burying the stump, and it seems reasonable to suppose that the advantages of this procedure largely outweigh the drawbacks.

Though this book does not set out to be a text-book of operative surgery describing every known operation in the body, it is too large and costly to be of much use to medical students. But the ideal which has inspired it cannot be too highly praised, for progress in surgery must lie along the paths of physiological study. For this reason the volume should rapidly establish itself in popularity with the practising surgeon, and should inspire many to follow the ideals laid down by its author.

BACTERIOLOGY AND IMMUNITY.

Le Bactériophage: Son Rôle dans l'Immunité. By F. D'HERELLE. Monographs of the Institut Pasteur. Paris: Masson et Cie. 1921. Pp. 227. Fr.12.

IN this monograph the author has collected, extended, and woven into a continuous argument the results of the researches carried out by himself and his collaborators during the last six years, which have for the most part appeared scattered through the proceedings of the Société de Biologie. The first part of the book deals with the phenomenon of transmissible bacterial lysis, now generally known as the d'Herelle phenomenon, and the various properties of the lysates thus obtained; whilst in the second portion the action of the phenomenon in vivo, and its relationship to immunity and recovery from disease, are discussed at length with full reference to the experimental work. For d'Herelle the sole explanation of this very remarkable phenomenon, which appears to have been observed by Twort and by Hankin, is that it is a manifestation of the vital activity of an ultra-microscopic organism which invades the bacteria and produces their dissolution and disintegration. This organism he calls the bacteriophagium intestinale, and boldly maintains its living nature in the face of all criticism. It is abundantly evident that the author is living in the shadow of Pasteur, and it is with Liebig in his mind that he insists upon this point with a reiteration almost deserving of the classical adjective. It cannot be said that he fails to make out a good case, although the very obscurity of the phenomenon must render its refutation somewhat difficult.

The portion of the book which deals with the bacteriolysis in the living body is of the greatest interest. The thesis is that through the intervention of this microbe the human body overcomes disease, and that the immunity of certain individuals in periods of epidemic is due to the presence in their alimentary canal of a bacteriophage capable of parasitising and destroying the causal organism. The commercial possibilities of this are, of course, almost limitless, and for this reason, if for none other, we may look to see the matter thoroughly exploited. After a very sane protest against experiments directed to elucidate the natural phenomena of disease being carried out on naturally resistant animals infected by laboratory manœuvres, the author details experiments made on two naturally occurring diseases in the lower animals: fowl typhoid and the hæmorrhagic septicæmia of bovines endemic in Cochin China. In both of these cases the results quoted support the author's contentions in a most striking manner, and lead him to the aphorism that "The beginning of an epizoötic is marked by the diffusion of the causal bacteria; its end by the diffusion of the bacteriophage virulent for this bacterium."

The whole of this work, some of the earlier portions of which have been confirmed by Bordet, who disputes the author's deductions but does not contest his facts, and by Martha Woolstein, of the Rockefeller Institute, is of extreme interest. Whatever the ultimate explanation of the phenomenon may be, there is no doubt that even if one-tenth of the matter put forward by d'Herelle stands the test of substantiation at the hands of independent workers he has written an entirely new chapter in the history of bacteriology.

THERAPEUTICS.

A Text-Book of Practical Therapeutics. Eighteenth edition. By H. A. HARE, M.D., LL.D., Professor of Therapeutics, Materia Medica, and Diagnosis in the Jefferson Medical College of Philadelphia. London: Henry Kimpton. 1922. Pp. 1038. 36*s*.

THE fact that this book has reached its eighteenth edition shows that it has been found a useful work of reference; the essentially practical information contained in it can be easily found—indeed, from its arrangement it might well be called an Index of Pharmacology and Treatment. The book consists of two main sections, the one with drugs arranged in alphabetical order, the other with diseases also arranged strictly alphabetically. Two smaller sections on general considerations and on remedial measures and food are added. Alphabetical order strictly maintained does not usually serve to make a book readable, and the contrast between this arrangement of matter and the easy style in which the articles are written is marked. Many practitioners who wish to look up a special subject or drug would prefer to have information conveyed in a less colloquial style; in some places, moreover, the advice given is homely rather than scientific, as where calomel is advised for light stools and podophyllin for dark stools, and for those which have a peculiar musty smell and a mouse odour. The friendly explanation of the difference between turpentine, spirit of turpentine, and oil of turpentine is, for instance, more fitted for a book of the type of Brunton's "Action of Medicines" than it is for a book where tuberculin and turpentine are herded together from similarity of initial letters.

The book is edited both for American and for British readers. The list of drugs withdrawn from the British Pharmacopœia owing to war circumstances might well be omitted now. A useful section gives a comparison of the weights and measures used in America and Britain. We are apt to consider that in retaining grains and ounces we are at least in company with America, but we find that owing to the use of avoirdupois and apothecaries' weights in Britain and America respectively, the adoption of the metric system in both countries is surely overdue.

THE LANCET.

LONDON: SATURDAY, APRIL 22, 1922.

The Prevention of Scarlet Fever.

THE two ways of attempting to control the spread of scarlet fever at present in vogue are: 1. The isolation of the patient in a fever hospital. 2. The Milne method of treatment by inunction of the skin with eucalyptus oil and swabbing the throat with carbolic oil. Advocates of the latter insist that it checks the spread of the disease at a much smaller cost than the first method, as the patient is nursed at home and the hospital expenses saved. This method is more largely used on the Continent than in England, but certain more or less inconclusive trials of its efficacy have been made in England. A few years ago Dr. WILLIAM ROBERTSON, medical officer of health of Leith, read a paper at the Congress of the Royal Institute of Public Health giving the results of his trial of the Milne treatment in the home isolation of scarlet fever cases at Leith, there being no room in the infectious hospital at that time. In his view there was some evidence that it was not without effect. Dr. R. MILNE claims that a patient suffering from scarlet fever can, after his treatment, mix with other children not so suffering, without danger. It is obvious that this claim could be justified if so-called return cases and secondary cases were eliminated. The return cases comprise cases occurring in homes to which children have returned after they have been discharged from hospital as free from infection. The secondary cases include fresh attacks of scarlet fever affecting patients in hospital who were sent in labelled as suffering from this disease. Whether they were wrongly diagnosed or not in the first instance is irrelevant in this connexion. According to Dr. MILNE, the second attack should not have occurred in either case. In order to test its value Dr. T. W. NAYLOR BARLOW arranged for the Milne treatment to be carried out in the Wallasey Infectious Diseases Hospital, and it is still being persevered with, although it does not appear to have prevented return cases, and secondary cases still occasionally occur. Instances of cross infection have been so rare both before and after the institution of the treatment as to make deductions on this count impossible. Another test is proceeding nearer home, for the treatment was started at Tottenham on April 3rd, and evidence may thence be forthcoming from the organised and systematic application of the method in the homes of the patients.

A discussion at the Metropolitan Branch of the Society of Medical Officers of Health, reported in our issue of March 18th, throws doubt upon the efficacy of isolation in preventing the spread of scarlet fever. Dr. F. M. TURNER pointed out that the number of notifications had not been markedly affected since the increase in the proportion of cases removed to hospital, although the incidence has certainly been less during the past 15 years; and he observed "that when at the height of epidemic waves of the disease M.A.B. hospitals had become blocked, and a large proportion of cases had been refused prompt admission, the course of the epidemic seemed to follow its natural bent, rising no more steeply after the failure of isolation than before, and, after reaching its height, falling before isolation overtook the arrears." It is probable that all the channels of infection of scarlet fever are at present not known, and although it is usually held that it spreads to a certain extent by direct contact, yet this is not in all cases the most important mode of dissemination. Thus during a milk outbreak the tendency to spread ceases when the supply of infected milk is stopped. Dr. T. SHADICK HIGGINS has suggested that infectious diseases form a series with measles and small-pox at one end, spreading almost entirely by direct contact, and cerebro-spinal fever at the other end, spreading far more commonly by carriers or some other means. Scarlet fever, he considers, would occupy a mean position in the series. For these reasons it would appear that isolation in hospital cannot possibly stamp out a disease such as scarlet fever, although it can to some extent modify its spread. But hospital isolation is of importance from the point of view of treatment. When it was first inaugurated over 40 years ago, the value of treatment to the individual was considered as of minor importance when compared with the benefit to the community in repressing an epidemic. To-day the skilled treatment received in a hospital is usually deemed to be as valuable to the patient as his isolation there is to the State, and it is possible that this accounts to some extent for the decline in mortality in recent years. Certainly the more severe complications, such as nephritis and otitis media, are much less likely to occur in hospital patients than in those treated at home.

Dr. L. C. PARKES believes that the milder forms of scarlet fever seen at the present day are due to a change of type in the disease, the decrease in scarlet fever mortality being due to this rather than to the value of hospital treatment. That the disease is very much milder now than formerly is beyond question, and the proportion of septic and toxic cases is considerably lower. This change of type is also seen to a lesser degree in diphtheria, but here the decrease in mortality is due chiefly to the use of antitoxin. It is thus clear that the value of isolation in the treatment of scarlet fever is by no means established, and as it is a question which affects not only the national expenditure but also the rights of the individual in the case of compulsory removal, it is worthy of further careful study.

Pernicious Vomiting of Pregnancy.

UNCONTROLLABLE or so-called pernicious vomiting of pregnancy is an interesting and often serious condition, the exact causation of which is still obscure, although the experimental investigation which we publish on p. 784 gives some reason for fixing responsibility on the corpus luteum. Excluding coexistent disease of the stomach, two main varieties have been described, the toxæmic and the nervous, the latter being also labelled hysterical. Renewed interest has been excited in the ætiology of this form of vomiting in view of the attempt which has been made to refer all these cases to a purely neurotic origin. It is, of course, a well-ascertained fact that during pregnancy there is an increased excitability of the nervous reflexes, many pregnant women being unduly sensitive to any form of suggestion. Moreover, the hypothesis that the most important ætiological factor is a neurosis is not by any means new. KALTENBACH, of Halle, taught many years ago, long before the toxæmia of pregnancy was recognised in the form in which it is described to-day, that if there was no disease of the stomach present

this form of vomiting was always amenable to appropriate psychical treatment. It is curious that uncontrollable vomiting appears to be of rare occurrence among pregnant women in Germany, a fact long recognised by obstetricians in that country. British writers who support the nervous theory of causation maintain that the disturbance of metabolism which is so striking a feature of these cases is a secondary condition, brought about by the resulting starvation and dehydration. That there is marked increase in the ammonia coefficient and that diacetic acid is generally present in the urine is, of course, well known —their significance is at present under investigation at the Royal Free Hospital—but these urinary changes are also met with in cases of starvation. It is, however, doubtful if the increase in the ammonia coefficient during pure starvation is ever so sudden or so marked as it often is in vomiting of the so-called toxæmic type. The assertion that all these cases can be cured by appropriate treatment of the nervous instability is no doubt well founded in regard to a large proportion, but that it holds good for all is probably incorrect. The case recorded by Dr. A. F. HURST in THE LANCET of March 18th is striking, but of itself proves little. The patient was one in whom the diagnosis of pernicious vomiting of pregnancy had been made, the ammonia coefficient was 28, and there was a large amount of diacetic acid in the urine, but no albumin or sugar. She was emaciated, with dry furred tongue and pulse-rate of 130. In this case relief followed psychotherapy of half an hour's duration, the vomiting ceased, the pulse-rate fell, the ammonia coefficient dropped to the normal, and the patient gained 16 lb. in weight in four weeks. The publication of this case led to a further valuable exchange of view in our correspondence columns between clinicians and laboratory workers, Mr. T. WATTS EDEN expressly welcoming any help which psychotherapy can give in obstetric practice.

The series of cases collated by Dr. CARLTON OLDFIELD in his recent presidential address[1] to the North of England Obstetrical and Gynæcological Society confirms the experience of those obstetricians who have seen many cases of pernicious vomiting that the vast majority of them get well in the end whatever the treatment. He records 29 cases treated either in hospital or in a nursing home, all of whom recovered, and in only one case was the induction of abortion necessary. The treatment was mainly suggestion, nurses and patient both being told that the condition was one of neurosis, and the nurses warned that the words vomit and sickness must not be mentioned in the presence of the patient. The patients were put on a full diet in graduated quantities, any vomiting that occurred being met by the assurance that it would certainly stop. In most cases a rectal infusion of 4 per cent. glucose was given, as a rule continuously by the drop method. Dr. OLDFIELD'S cases would be the more convincing if sugar had not been given, as he was in fact carrying out, in part at least, the treatment urged by Prof. V. J. HARDING which is founded on the liver-glycogen theory[2] carefully elaborated by himself and Prof. B. P. WATSON. Unless, the argument runs, a state of equilibrium is reached between the glycogen stored up in the placenta for the needs of the fœtus and that in the maternal liver a deficiency of maternal glycogen ensues. Prof. HARDING regards the most important ætiological factors in these cases to be this deficiency of glycogen in the maternal liver coupled with intestinal intoxication due to constipation, and accentuated by an excitable nervous system. The lack of glycogen in the liver is followed by fatty infiltration of that organ, this in its turn leading to a feeling of nausea and a distaste for food, resulting in starvation with its disturbance of metabolism. Accordingly the treatment advised consists in the administration of glucose, of aperients, rest and isolation, and the administration of water. Evidently there is little difference between the mode of treatment adopted by Prof. HARDING and that adopted by Dr. OLDFIELD, and perhaps there is not so much difference as would appear at first sight between their conceptions of ætiology. The one, however, lays most stress on the neurosis and regards all the metabolic changes as secondary, while the other regards the disturbed metabolism as the primary factor, acting mainly in association with secondary factors, one of which is nervous excitability.

We are still in need of further facts regarding the metabolic changes which occur in the normal healthy pregnant woman, and when these have been worked out in detail no doubt our knowledge of the exact factors in the production both of simple and of the pernicious vomiting of pregnancy will be increased. At the same time, the excellent results which can be obtained by treatment directed mainly against neurosis demonstrate how large a part is played by this factor in obstetric practice and corroborate what has long been surmised. Indeed, it may be said with truth that one of the rarest operations ever performed in a well-conducted obstetric clinic is the induction of abortion for pernicious vomiting of pregnancy. Mr. J. S. FAIRBAIRN spoke for St. Thomas's in this respect in his letter last week. The striking results now being adduced from various lines of treatment suggest that this operation will become obsolete.

[1] To appear in the Journal of Obstetrics and Gynæcology of the British Empire.

[2] THE LANCET, 1921, ii., 327.

Local versus General Anæsthesia.

THEIR administration, in England at any rate, is now so excellent that we tend to assume that nothing can equal general anæsthetics. The induction is quicker than is the introduction of the local anæsthetic, and in hospital practice this plays a great part. But it is worth considering whether the gain to the patient in the abolition of unpleasant post-anæsthetic effects would not compensate him and the surgeon for a little extra time spent in preparation. Post-operative effects have, indeed, been considerably reduced, especially since the introduction of gas and oxygen, but the apparatus for this method is bulky and difficult of transport, and hence in all institutions, other than the large hospitals and nursing homes, the older methods of ether and its substitutes are still employed. Wherever local anæsthesia is much practised, it has come to be recognised by the public as being desirable, and is even asked for in cases where it is obviously unsuitable. Moreover, a surgeon armed with the necessary knowledge and experience can, by the use of a local anæsthetic, dispense with the services of an anæsthetist. In the sixth edition of Dr. H. BRAUN'S work[1] the results of recent experience have been included, with a very fair and just discussion on the employment of local as compared with general anæsthesia. The author, while in favour of the use of local anæsthetics wherever possible, quite

[1] Die Oertliche Betäubung. Sixth edition. By Heinrich Braun, Geh. Medizinalrat, Direktor des Krankenstiftes in Zwickau. Leipzig: Verlag von Johann Ambrosius Barth. 1921. Pp. 508.

frankly acknowledges their limitations, and points out the dangers and complications attached to their unrestricted use. Regional, plexus, lumbar, sacral, paravertebral and parasacral, and splanchnic anæsthesia are all dealt with in detail, and the book is comprehensive without being bulky. It is to be regretted that no English translation has appeared since the excellent one of the third edition—which appeared in 1913—by Dr. PERCY SHIELDS.

It would be interesting to ascertain why it is that in England and America general anæsthesia has been developed at the expense of local, while on the Continent the reverse process has taken place. It is notorious that on the Continent anæsthetics are badly administered, and the reason is not difficult to find. Local anæsthesia is so widely used that no systematic teaching in the administration of general anæsthetics is provided, and students on qualifying start practice often never having given an anæsthetic. Specialist anæsthetists are quite unknown. On the other hand, the technique of local anæsthesia is understood by every student; every surgeon knows its uses and abuses, and is a master in its application. Of how many surgeons in this country can that be said? In this as in every other surgical procedure, practice is essential in order to secure a good and certain result. Local anæsthesia has largely been brought into disrepute in this country by the spasmodic attempts at its employment, often in those cases only in which a general anæsthetic is contra-indicated, by surgeons. And their experience in its use may be limited to minor procedures, as an excision of a sebaceous cyst, or, having little familiarity with the subject, they may infiltrate the whole area of operation so as to obliterate all the landmarks and to render the tissues swollen and unrecognisable. The patient complains of pain, and the surgeon, hampered by the œdema and displacement of the parts, swears that in no circumstances will he ever be persuaded to use a local anæsthetic again. The technique of a good local anæsthetic is by no means easy to carry out, and it is recognised, in countries where its use is common, that considerable experience is necessary in order to procure a good result with a minimum of disturbance to the patient. Block anæsthesia, in which the anæsthetising solution is injected into the neighbourhood of the nerve trunks supplying the field of operation, thus cutting off all the impulses to and from the part, and leaving the operation area free of disturbing fluid, is perhaps the best method for general use. The most vulnerable point of the nerve trunks, and the easiest direct route of approach with the injecting needle, have been carefully worked out. But skill and experience are required to enable the operator to hit the nerves every time, and to know just how much fluid to inject at each point. Organised instruction at educational centres would seem to be indicated.

VOLUNTARY HOSPITALS COMMISSION.—The grants made by the Commission now amount to over £127,000. Among the more important recent grants are:—

Bristol Royal Infirmary (for reopening closed beds)	£3,350
Sheffield Royal Infirmary	10,000
Sheffield Royal Hospital	7,650
Royal Albert Hospital, Devonport	1,000
Middlesex Hospital	5,000
West London Hospital	3,500
Prince of Wales Hospital, Tottenham	1,800

The majority of grants up to the present have been made to London hospitals, but this is mainly due to the fact that the figures for income and expenditure in 1921 were available earlier in the case of London hospitals than in the provinces. Hospitals which had a deficit on the maintenance account for 1921 should take steps to complete their accounts without delay, so that they may be in a position to apply through the local hospital committee for a grant.

Annotations.

"Ne quid nimis."

PIERRE DUVAL AND THORACIC SURGERY.

OF the three great cavities of the body, the thorax has been the last to yield habitual right of entry to the surgeon. It is true that Macewen, of Glasgow, as far back as the beginning of the century, made pioneer advances in thoracic surgery, and had successfully excised the greater part of one lung by a very simple technique. His efforts, however, met with what is sometimes felt to be the usual neglect of home-grown discoveries, and until within recent years the eyes of surgeons were directed to Germany, where laborious efforts were made to operate on the chest without producing pneumothorax. Sauerbruch, for instance, constructed an elaborate vacuum chamber in which the operator and the body of the patient were enclosed at a negative pressure, while the patient's head was in the outer air. Alternatively the head of the patient was enclosed in an air-tight positive pressure chamber, so that collapse of the lung upon opening the thorax was prevented. These elaborate precautions have been made to look rather foolish, and even the simple method of preventing collapse by intratracheal anæsthesia has been superseded by the work of French and English surgeons in the war, and especially by that of Pierre Duval.

It was Duval who showed, when in charge of Auto-Chir. Unit No. 21 of the French Army, as early as December, 1916, that immediate operation by free thoracotomy could save otherwise hopeless cases of pulmonary hæmorrhage. Of the first 14 cases operated upon 9 recovered. Subsequently Prof. Duval was closely related to a British casualty clearing station, and the esteem he gained from his British colleagues may be judged by the fact that they anonymously translated into English his French work on "Wounds of the Thorax" as a token of their admiration for him, surely a very charming compliment. Under the auspices of the University of London, Prof. Duval expounded his views on thoracic surgery in a lecture at the house of the Royal Society of Medicine, London, on March 27th. He showed, in opposition to the German school, that surgical pneumothorax is not dangerous if precautions are taken. These precautions consist first in the fixation of the thorax and diaphragm on the side operated upon. For this purpose the thorax is very freely opened by an incision following the line of a rib, the adjoining ribs being powerfully retracted. The lung is then thrust back into the posterior part of the cavity and covered with a hot swab, so that it is completely collapsed. The operation, whatever it is, can then be proceeded with at leisure. Owing to the comparative fixity in man of the central or mediastinal structures of the thorax, pneumothorax on one side does not interfere with the normal action of the opposite lung, and no dangerous hindrance to circulation or respiration follows. In fact, as Duval pointed out, the more complete the unilateral collapse the better for the patient. On the other hand, in certain animals—for instance, in the dog—owing to the mobility of the mediastinum, unilateral pneumothorax is followed by collapse of *both* lungs, and it has been erroneously assumed that the effects in man are exactly the same as they are in the dog.

When the operation, whatever it is, has been completed, Duval shows that it is necessary completely to close the thorax and then immediately to aspirate the air which remains in the pleural cavity. This is done by an ordinary syringe. The lung reinflates itself, and functions once more normally. Apart from emergency operations, Duval has operated upon more than 100 cases by this method with only two deaths, and these not immediately following the operation. His methods illustrate the triumph of mind over machinery.

SELENIUM IN MALIGNANT DISEASE.

DURING recent years claims have been made, more particularly in continental journals, of successful treatment of malignant disease by injections of selenium and copper in colloidal form. In the April number of the *British Journal of Surgery* Mr. A. S. Gillett and Mr. C. P. G. Wakeley give an account of 100 cases of malignant disease treated at King's College Hospital by the injection of selenium. Cancer in the breast and tongue, the œsophagus, the stomach, the intestine, and genito-urinary tract were treated, as well as one case of lymphadenoma, and one of periosteal sarcoma of the femur. It is clear, therefore, they have tested the method in a comprehensive manner. The results of the treatment, the number of doses given, and the amount used in each case are tabulated for the first 50 cases. All but two of these 50 are dead. Of the second 50, which are not tabulated for lack of space, 30 have died, 10 are dying, and 10 are alive; of these 10 living, six are cases of atrophic scirrhus of the breast; the two still alive of the first 50 are also examples of the same disease. All the patients have been treated since July, 1919, and death in the majority of them took place within a few months of the beginning of the treatment. The majority of the cases had been operated on for removal of the primary focus, or some form of palliative operation had been undertaken, and the selenium treatment appears to have been carried out either to prevent a recurrence or relieve the local signs and general symptoms. The drug was given by intramuscular injection, the initial dose being 1 c.cm., and the amount steadily increased until a maximum of 5 c.cm. was attained. The interval between the doses was determined by the amount of pain and local reaction which was produced. A leucocytosis was present after the earlier but not after the later injections. To these facts the apparent local and general improvement in the early stages of the treatment may perhaps be attributed. After later injections, to quote the authors' words, the opposite state of affairs is seen; general toxæmia becomes worse, whilst ulceration, necrosis, and secondary hæmorrhage supervene. The authors suggest, therefore, that if selenium is to be given it should be limited to two or three small doses. In many cases the severity of the pain following the injections, and the local and general reaction, led to a discontinuance of the treatment. The conclusion arrived at is that temporary improvement is the most that can be expected, and to obtain this small doses are essential. The discomfort of selenium injections to the patients is in striking contrast to the ameliorative effect of pituitrin injections observed by Mr. J. H. Norgate at the Southmead Infirmary, Bristol, and recorded in the same issue of the *Journal*.

FOCAL ADJUSTMENT IN THE APHAKIAL EYE.

EVERY now and then a case is recorded in which the power of accommodation is apparently retained by eyes from which the crystalline lens has been removed for cataract. In a recent case recorded by Dr. F. Park Lewis, of Buffalo,[1] the patient with his distance correction unchanged in position before his eyes could read the smallest test type at seven inches—i.e., he apparently possessed between five and six dioptres of accommodation. These cases have usually been explained in one or other of the following ways: (1) a small pupil or small opening in the capsule, by cutting off the peripheral rays, has increased the acuity of vision; (2) there is an acquired power of interpreting the circles of dispersion; (3) by looking through a strong plus glass diagonally the strength of the glass is increased. A new explanation of a novel character is put forward by Dr. Lewis. In the eye of an ox, he says, the vitreous is not homogeneous, but consists of two parts, an outer portion in which the density is very slight, and which is of a thin gelatinous consistency, and an inner portion which is relatively firm. If the same holds good of the human eye, it is assumed that by the action of the ciliary muscle the whole vitreous is brought forward and that the denser portion, being pressed against the ciliary body, has the curvature of its anterior surface increased, forming a sort of vitreous lens. The theory is ingenious and challenges investigation. If it is true, however, how is it that cases of apparent accommodation in aphakia are the exception and not the rule? The limits included in the phrase "normal vision" are wide. The ordinary vision test is to decipher letters of a certain size at a distance of six metres. Many people can make out letters little more than half the normal size at this distance. It seems therefore probable that the true explanation of apparent accommodation in aphakia is simply that some people have a far greater power of interpreting blurred images than others.

[1] Transactions of the American Academy of Ophthalmology and Oto-Laryngology, 1920.

EXPERIMENTAL PLUMBISM.

BY feeding pigeons with lead pellets P. J. Hanzlik, M. McIntyre, and E. Presho[1] produced chronic lead poisoning. This was characterised by a prompt loss of body-weight and appetite, gradual depression, diarrhœa, increased crop peristalsis with regurgitation of contents, loss of equilibrium, wing-drop—which corresponds anatomically to wrist-drop in man—paralysis of legs, marked emaciation, and death at the end of about 21 days. The principal lesions observed after death were atrophy of the skeletal muscles everywhere, and sometimes darkening of the mucosa of the large intestine and cloaca. The lethal dose was 0·16 g. per kilo of body-weight; time of death in fatal cases, 21 days; time of recovery in survival cases was one to eight months. The lead absorbed in fatal cases was 85 per cent. of total dose, the maximum loss of body-weight in fatal cases was 40 per cent., in surviving pigeons 8 per cent. All of the above factors were beneficially influenced by the administration of sodium iodide in food and water, and magnesium sulphate and calcium sulphide in food, while sodium chloride administered in the same way was not beneficial. The following lead salts, viz., chloride, iodide, acetate, and sulphide, administered in doses whose lead content was 2 to 13 times that of the fatal minimal dose of metallic lead, were non-toxic. The toxicity of certain closely-related metals was tested in 2½ times the dosage of the minimal fatal dose of lead, namely, zinc, tin, copper, bismuth, iron, and cadmium; only zinc, bismuth, and cadmium were toxic, but not fatal during a period of 27 days of observation. Lead is therefore decidedly more toxic, and plumbism is more or less a specific toxicity in the sense that symptoms occur promptly and in a striking manner, the motor effects and fatalities being absent with cadmium, zinc, and bismuth.

[1] Soc. for Expt. Biol. and Medicine, xix., 1922.

LEPROSY IN FRENCH CENTRAL AFRICA.

IN the *Archives de Médecine Militaires* for November last Dr. Laporte (Lieut.-Colonel and Director of Pathology of the French Army on the Rhine) describes three cases of leprosy observed in 1919 in natives of Senegal. The earliest observed characteristic lesion was an anæsthetic copper-coloured patch, which very conspicuously contrasted with the shining blackness of the African's skin, and was edged by small black papules. From the first case a portion of skin was removed and after section was found to be granulomatous and to contain myriads of leprosy bacilli. These were also found in the same patient's nasal mucus. The other cases showed the anæsthetic patches, but no bacilli were found in the nasal mucus, even when an iodide coryza was set up. On examining two native battalions in 1917 Dr. Laporte found 23 cases of leprosy who were forthwith sent back to Senegal, though in no case were leprosy bacilli found in their nasal mucus. Several of these men, before they came to Europe, were already, it appeared, known in their districts to be lepers, but they had been substituted by the village headmen for other natives who had successfully passed

the medical examination for service, but whom the headman desired to retain at home. Dr. Laporte goes on to draw attention to the grave risk of the dissemination of leprosy in war-time, observing that isolation of the affected is the best measure of prophylaxis that has ever been found. He suggests that leprosy is spread by dissemination of the nasal mucus by sneezing, coughing, or speaking, perhaps by mosquitoes or very easily by contact with second-stage tubercles which so readily ulcerate. In one of his cases the first (macular) stage had lasted for five years. Dr. Laporte does not mention the great assistance given in the diagnosis of leprosy by X ray examination[1] which early makes manifest the absorption which has begun in the distal phalanges, before the fingers or toes show any external evidence of the disease.

THE EX-EMPEROR KARL.

THE attack of pneumonia to which the ex-Emperor Karl succumbed was obviously a typical one, sudden, and severe; as too often happens the nature of the illness was not recognised until the patient was in a critical state. Dr. Michael Grabham, of Funchal, Madeira, writes to us as follows: "The gravity of the condition was only recognised when the malady had become well established, the increasing severity of the symptoms becoming alarming to the Empress and her attendants. The illness was sudden and acute, and pneumonia, rapidly developed in both lungs, rendered all treatment unavailing. There was no rallying, and the Portuguese physicians in attendance seem to have had no time to summon further consulting opinion to the bedside." Dr. Grabham adds: "The ex-Emperor had gained the sympathy of everyone on the island with whom he came in contact by his placid acquiescence in the inevitable after his vain attempt to regain his throne. He was in residence at one of the most sumptuous of the Madeira *quintas* placed at his service by a wealthy resident, and all that the island could do was done to mitigate the tedium of his banishment; and though he attended no social gatherings he was cordially grateful for all attentions, meeting them with a natural courtesy which was extremely attractive. Only a month ago he attended the inauguration of a new cathedral clock which I was presenting to the Municipality of Funchal, when he acted with the Island Governor as sponsor in the quaint and mediæval baptismal rite which still survives. He seemed then in high spirits, and as we stood together reading the ancient legend on the hour-bell—'Sanctus Deus: sanctus Fortis; sanctus Immortalis: miserere nobis'—we little thought how soon the brazen petition would vibrate to the death-knell of the exile."

OBSTETRICAL SHOCK.

VARIOUS accidents, due to political unsettlement, have hitherto prevented reaching this country any report of the Obstetrical Section of the Royal Academy of Medicine in Ireland held last December. At this meeting Prof. Hastings Tweedy made an important communication upon obstetrical shock. H. H. Dale and other workers had, he said, conclusively proved that a poison generated in bruised muscle was a potent factor in obstetrical shock. Other protein material could generate this poison and obstetricians had every opportunity of observing that it could arise in freshly effused blood. Ruptured tubal pregnancy, concealed accidental hæmorrhage, and hæmatoma of the vulva all supplied evidence of this fact. Liquid blood was more poisonous than that which was clotted and thus hæmatocele could be accounted for. If the woman survived the initial toxic dose the blood would have time to clot. Shock was associated with a general elongation of all muscle fibres. The pupils, the anus, the bladder, the intestines, and the cheeks demonstrated this. The veins, and at a later stage the arteries, seemed to be also affected; indeed, a great dilatation in the capillaries and veins might account for the phenomena of shock. In the uterus this elongation was better demonstrated than in any other organ, and the condition was evidently one of "retraction reversed." Contraction, a temporary shortening of muscle fibre, was under the control of the nervous system; retraction was a property inherent to the muscle itself, it took place in a flabby inert muscle and was the chief factor in preventing hæmorrhage. The process was slowly reversed during the growth of a pregnant uterus and rapidly reversed in shock. Accidental hæmorrhage, Prof. Tweedy contended, was of toxic origin; if the blood did not quickly escape its products caused shock, which led to dilatation of the uterus. The condition was, therefore, not due to a diseased atonic uterus, and the fallacy of hysterectomy for its relief was apparent. Cæsarean section, with a smaller mortality, was more effective in the control of hæmorrhage. Uterine inertia was no contraindication for delivery by forceps, for inertia was no bar to retraction. It was shock and not inertia that was to be dreaded. Lastly, Prof. Tweedy reminded his hearers that the "retraction reversed" fibre was quite capable of contraction, and this was probably the condition found in the arteries during the early stages of shock.

[1] Dr. T. Miller: THE LANCET, ii., 1913, p. 219.

THE MENACE OF THE LOUSE.

"LICE are small, entirely wingless, parasitic insects, whose only food is mammalian blood." With this terse sentence Dr. James Waterston begins his pamphlet, recently issued to replace "The Louse and Its Relation to Disease"[1] as No. 2 of the Economic Series of the British Museum (Natural History). The life and habits, connexion with disease, and means of destruction of the louse are vividly described in this twenty-page monograph. Mr. C. J. Gahan, keeper of entomology at the British Museum, contributes a preface wherein he refers to the valuable help given to Dr. Waterston in his summary of recent research by Prof. G. H. F. Nuttall, F.R.S., and Mr. A. W. Bacot, whose tragic death from typhus while pursuing his investigations at Cairo we record on p. 817. Dr. Waterston dismisses at the outset the idea, still widely held amongst the lay public, that lice breed in or from dirt; even the eggs require to be laid in close proximity to the host's skin to secure a temperature suitable for incubation. On man three forms of these parasites are found—*Pediculus humanus capitis*, *Pediculus humanus corporis*, and *Phthirius pubis*; other mammalian lice may stray on to man, but whether they can survive is doubtful, except in the case of *Hæmatopinus suis*, the hog-louse, which has been known to attack human beings. Of the three specific parasites of man, the last-named—the crab-louse—is easily recognised by its shape, and may infest any part of the body where the hair is suitable; the straight hair of the head, however, does not permit it to retain its hold there. Beyond causing feverish symptoms—possibly due to saliva injected in the act of biting—the crab-louse is not known to have any effect on the health of the host, and has not been proved to carry any disease. One female may lay up to 26 eggs, which are attached to the bases of single hairs; the adults anchor themselves to two. This species is practically stationary throughout its short life of from seven to eight weeks; it may move not more than two inches from its birthplace, and that always in a sideways direction. Adult crab-lice are disseminated by actual contact with an infested person.

As regards the head and body lice, no single character is demonstrable whereby the two can invariably be separated. The head-louse is generally smaller, darker, and more horny, with thicker antennæ and more deeply-cut abdominal divisions, but the two species breed freely with one another, and

[1] The Louse as a Menace to Man: Its Life-History and Methods for Its Destruction. By James Waterston, B.D., D.Sc. British Museum (Natural History): Economic Series No. 2. London. 1921. 6*d*.

their hybrids are fertile for several generations. The head-louse is probably the more primitive, the body-louse having been developed with the acquisition of clothing by its host. The life-history of the two is practically the same. The female of either species lays up to 300 eggs at the rate of from 8 to 12 a day, depositing them either on cloth or hair. A drop of a quickly-hardening cement is exuded immediately before the egg, which instantly fixes the latter down; both cement and egg-shell are of a chitinous nature, and resist the action of solvents which suffice to destroy the hair or fabric whereon oviposition has taken place. The time elapsing between oviposition and hatching varies greatly according to the temperature maintained; under natural conditions near the body, and assuming that the clothing is not removed at night, about a week may be taken as the normal period. The young louse proceeds to feed immediately upon emerging from its shell. Between the egg and adult stages it moults the skin three times; this period generally occupies about 17 days, and the life of the adult louse lasts for from three to five weeks beyond that time. Mating may take place so early that a female has been observed to lay fertile eggs within 24 hours of the last moult. With regard to dissemination, body-lice tend to leave a host whose temperature rises above or falls below normal; they respond very quickly to warmth and at once fasten on any textile that touches them. The wearing of linen overalls is to be recommended where lice are likely to be encountered. There is no necessary connexion between dirt and lousiness, though conditions conducive to self-neglect favour the increase of lice once they have gained a foothold. Transference may be immediate—as from nurse to child, or from bed-fellow to bed-fellow—or mediate, as when discarded lousy clothing is put on. The parasites are also spread in many casual ways—by dropping from clothing, or by being blown by the wind, and also by the agency of domestic animals and even house-flies. The incidence is roughly as follows: head-lice are commoner on women and children, body- and crab-lice on men, but all three may exist on one host. In Britain lice are more common in winter than in summer. No satisfactory figures for dense infestation are available; in ordinary cases they are met with in tens and hundreds, and on one army shirt about 10,000 adult lice, and as many nits, were counted. The finding of nits on the hair is, of course, diagnostic; the back of the head should be carefully combed, the stroke being brought upwards and forwards, when lice are suspected.

The factors in spreading lice are conditions imposing crowded accommodation on large numbers of persons without adequate facilities for ridding themselves of the parasites. The most dangerous individual carriers are those who have a natural or acquired insensitiveness to louse-bites. A long step towards the solution of the louse problem would be taken if the poorest of the population were assured of a weekly change of underclothing. Of the diseases borne by lice, typhus, relapsing fever, and trench fever are the chief; the first two are hereditary in lice, and are often conveyed by the crushing and rubbing of the louse's body into some cut or abrasion. Except in typhus—which is carried by lice *alone*—the actual bite of the louse is of little account, but the victim's scratching and rubbing are important factors in the spread of disease. The bacillus of plague has also been found in lice feeding on plague patients, but there is no evidence to show that the parasite is of importance in that connexion. Many skin troubles are also initiated by lice, which in extreme cases may lead on to death by blood poisoning. As regards destruction of lice, a place is louse-infested only in the sense that the people living or meeting there are verminous. The problem of destruction resolves itself into (*a*) the cleansing of the lousy person—preferably with undiluted paraffin emulsion, the customary precautions as to removal of hair being observed in severe cases—and (*b*) the destruction of insects and eggs in clothing, bedding, &c., by baking or steaming. All lice and nits can be killed by half an hour's exposure (dry heat) at a temperature of 50° C. (or 122° F.). Finally, lice may be got rid of by dry storage alone. If a temperature of 23° C. (or 73° F.) can be depended upon, all lice on garments will be dead, and the eggs either hatched or shrivelled up, within a fortnight. Otherwise, stored clothing should not be regarded as above suspicion until three or four weeks have elapsed.

LYMPHOCYSTIC URETHRAL LESIONS.

Dr. P. S. Pelouze,[1] of Philadelphia, who records 75 illustrative cases, maintains that lymphocystic lesions in the posterior urethra are evidence of active tuberculous lesions in various parts of the body. This view was first expressed by him in 1915, and in spite of opposition has been confirmed by subsequent clinical and post-mortem observations. Seventy-five patients, or 83·3 per cent., of those in whom a careful clinical examination was possible showed strong evidence of an active tuberculous lesion, which in 82·6 per cent. was situated in the lungs. Of 16 cases who presented these cysts at autopsy, all but two showed extensive active tuberculosis, and of the two exceptions one had been treated for tuberculosis and showed healed tubercles of the spleen, while the other showed old apical lesions. Dr. Pelouze does not claim that the urethral lesions are a primary urogenital tuberculosis, that the associated tuberculosis is necessarily in the urogenital tract, or that the urethral lesions are tuberculous. On the contrary, he points out that these lesions are rarely tuberculous, but are probably due to the action of some tuberculotoxin, and that the associated lesions are usually in the lungs. The urethral lesions, which are most often multiple, are usually situated on the ridges at the posterior attachment of the verumontanum. They are true submucous formations, and do not involve the subjacent prostatic tissue. Tuberculous œdema and papillary carcinoma, which may have the same contour, are distinguished by their deep-red colour in contrast with the cysts, which are covered by a practically normal mucous membrane. The commonest subjective symptoms are burning in the urethra, often referred to the fossa navicularis but sometimes located at the peno-scrotal angle, along the entire urethra, in the perineum, rectum, or occasionally in the vesical neck. Sexual symptoms, such as premature ejaculation and nocturnal emissions, sometimes occur. The more severe symptoms are generally due to some massive tuberculosis either in the bladder or the prostate, or to a coexisting prostatitis, and are not directly due to the coexisting lymphocystic lesions. Treatment should be directed rather to the coexisting tuberculosis than to the local lesions, except where urethral discharge is troublesome when intravesical irrigation may be used. The burning on micturition can usually be relieved by oral administration of a palatable form of creosote.

"THE PLACE OF PULMONARY TUBERCULOSIS AMONG THE ACUTE FEVERS."

Dr. J. Campbell McClure's presidential address, thus entitled, to the Tuberculosis Society on March 27th, drew attention to a point which seems at times in danger of being forgotten. It is a pose amongst a certain school to ignore the fact that tuberculosis is essentially one of the specific infectious fevers, and to concentrate on economic and social factors which, if words have any meaning at all and our pathological conceptions are not to be entirely scrapped, are merely subsidiary. *Ex nihilo nihil fit* may in this connexion be conveniently translated, "Without the tubercle bacillus there can be no tuberculosis"; and in its absence neither poverty, lessened purchasing power of wages, neglect by those in authority, nor any combination of these can have any effect in calling the disease into existence. This is not, however, to say that these factors, subsidiary though they be, have no influence whatever upon the course of the disease, or that, when isolated and

[1] Journal of Urology, March, 1922.

promptly countered, they exert no influence upon the diminution of its death-rate. It is an interesting question this of the falling death-rate from tuberculosis. L. Cobbett has given good reasons for his belief that it is unconnected with progress in sanitary measures, for it began to manifest itself before sanitation became a matter of practical policy. It may be due to decreasing virulence of the causal organism or, on the other hand, to more or less complete immunity produced by persistent but minimal infections together with associated conditions; and, in this connexion, Dr. Campbell McClure asserts that the most chronic types of tuberculosis he has ever come across have been in families which have survived for generations the disgusting conditions of ghetto life in Central and Eastern Europe. But, whatever the cause, the phenomenon seems to be only one instance of the general rule that all the infectious fevers are, some of them no doubt more slowly than others, becoming less fatal in their effects, though not necessarily less widespread in their incidence. There are differences in this respect between them. With certain of them, small-pox for instance, the death-rate rises and falls in sympathy with the attack-rate. A diminished attack-rate, which implies successful vaccination and a more or less inviolate sanitary cordon, means a diminished mortality. The United States have recently afforded instances of increased incidence going hand in hand with increasing mortality. With other fevers, and of such is tuberculosis, the death-rate is apparently independent of the attack-rate. In tuberculosis the attack-rate, if we are justified in placing implicit confidence in the reactions of the skin to tuberculin, remains at a constant yearly maximum, but the death-rate continues as steadily to fall. If the diminished lethal effect of tuberculosis be indeed due to a species of vaccination and more or less complete immunisation, then it would seem to be hardly reasonable to anticipate a further fall in the mortality from this cause alone, and other factors must be involved. It is here that some of the subsidiary factors may play a part, but it is noteworthy that as our knowledge has gained in exactness and scope, some of these, such as bad housing, overcrowding and the like, have been shown to be without much influence in this respect, and others hitherto assumed to be of equal or greater importance, may yet suffer a similar eclipse. Though the problem, by the elimination of popular if vague and indefinable factors, is thus being reduced to less complex terms, the solution does not appear to come any nearer. The result may be to remove the disease from the playground of the social reformer and the economist, and to hand it back to the biologist and the medical man to whom it rightly belongs.

BACILLURIA AND APPENDICITIS.

SYMPTOMS referable to the urinary tract are not rare in association with appendicitis, but the meaning of this association has not received the attention it deserves. A notable attempt to throw light on the subject has recently been made by Dr. O. Usland,[1] who has systematically examined the urine in cases of acute and chronic appendicitis. Among 34 cases of acute appendicitis examined between October, 1920, and May, 1921, there were as many as 20 with morbid conditions of the urine. In two of these cases the problem was obscured by a history of gonorrhœa or hypernephroma; of the remaining 18, 10 were subjected to routine examination of the bladder and ureters by cystoscopy and catheterisation of the ureters. The germs found in these 10 cases were staphylococci and coliform bacilli in four cases, streptococci and coliform bacilli in one case, staphylococci alone in four cases, and coliform bacilli alone in one case. On discharge from hospital after operation for appendicitis, the urine in all these cases proved to be sterile—an observation which left little doubt as to the source of the bacilluria. Still more instructive is Dr. Usland's account of five cases of chronic appendicitis, which shows that in this class of case the patient may be treated for years in vain with fashionable urinary antiseptics prescribed on account of urinary symptoms. In all five cases removal of the offending appendix was followed in 10 to 60 days by the disappearance of bacteria from the urine and of every other sign of disease in the urinary tract. In each case a careful examination was made for septic foci in the mouth, throat, tonsils, nose, middle ear, and other structures with a negative result. In several cases the germs found in the urine were identified with those found in the appendix, and in every case catheterisation of the left ureter yielded sterile urine, while catheterisation of the right ureter yielded a variety of organisms. It would thus seem that the supply of bacteria to the right kidney and renal pelvis is kept up by the focus of inflammation in the neighbouring appendix; while the germs in this place had secured a permanent footing, they enjoyed no security of tenure in the urinary system, although they were active enough in this system to give rise to troublesome symptoms such as pain on micturition. The doctrine of focal infection has now reached a stage when it is liable to be parodied by undiscriminating enthusiasts and to fall into disrepute. But papers such as Dr. Usland's make it transparently clear that this doctrine contains more than a modicum of truth, and that it leads to therapeutic measures which would probably have been neglected without it.

[1] Medicinsk Revue, January, 1922.

PENSIONS ADMINISTRATION.

ON April 11th a motion relating to the present administration of pensions was brought before the House of Commons by Mr. Charles White, who moved that the reductions now being made in the pensions of ex-Service men and dependents is unwarranted and creates serious hardships. In calling for the appointment of a Select Committee to inquire into the process of reduction and into the general administration of pensions he made the following allegations:—Unprecedented dissatisfaction existed in the country at the present moment owing to the fear that the forthcoming reduction in Pensions Estimates—understood to be something like £20,000,000—would be made at the expense of the pensioner and the dependent. The concerted action now being taken by medical boards and inquiry officers to reduce pensions suggested to him that some hint had been given that economy must be extended in these directions. The amounts of pensions were being reduced after the most casual and cursory examination by medical boards, consisting sometimes of one doctor, sometimes of two doctors, instead of three. A man could appeal from the decision of the medical board to the Medical Appeal Tribunal, but there was great reluctance on the part of the latter to upset the decisions of the original medical board. The standard of disability was often reduced on the most unwarrantable grounds to, say, 20 per cent. for a limited period, with a recommendation that a lump sum, usually about £10, be paid in final settlement. Another subtle method was to decide that aggravation had passed. Mr. F. Roberts, seconding the motion, urged that a pensioned soldier should not be denied his rights because of a missing link in the chain of material medical evidence. While he agreed that it would be extremely unwise to interfere with the work of the Pensions Appeal Tribunal at the present moment, he wished to do everything possible to prevent such a large number of cases leaving the Ministry in the unsatisfactory form in which they were coming before the Appeal Tribunal at present.

Mr. Macpherson, Minister of Pensions, said, in reply, that the case against the Ministry showed natural suspicion that because the Estimates for the succeeding year had been reduced by £3,000,000 beyond the recommendation of the Geddes Committee there was something wrong, and the idea was that the pensioner was being "done." He declared that so long as he was Minister of Pensions whatever economies were effected they should not be at the expense of

the ex-Service men. He had to deal with 3,500,000 beneficiaries, and it would be very strange, indeed, if Members of the House could not bring up cases in which on the face of them there would appear to be hardship, but the volume of expenditure on pensions must necessarily and inevitably be a declining quantity. When he became Minister it was £123,000,000 a year. That figure had come down this year to £111,000,000; next year it would be £90,000,000. The diminution in expenditure was due to three important causes—the re-marriage of women, the natural growth of children beyond pensionable age, and the deaths of pensioners. These causes had accounted for a reduction of £2,500,000 in the Estimates. He had also largely diminished the administrative expenditure. Under the War Pensions Act he had established final medical boards, and he hoped that by the end of next year every pensioner would have been examined in order to show whether his disability was to be final or not. In conclusion Mr. Macpherson made the attitude of the Ministry quite clear. He would welcome the reopening of cases in which fresh and undoubted evidence had been obtained by a man in support of his case, but he was strongly opposed to the appointment of a Select Committee.

EFFECT OF X RAYS ON GASTRIC SECRETION.

THE effect of X rays in diminishing the gastric acidity has recently been the subject of experiments by Dr. Miescher.[1] By means of Pavlov's diverticulum in a dog the gastric secretion was collected, after the application of the X ray to the stomach, half-hourly until the secretion stopped. The first dose was given in May, 1920, and four subsequent doses were given in the period from December, 1920, to February, 1921, at intervals of three weeks. On the first day after the first dose the acidity fell considerably, but reached its maximum diminution of 40 per cent. of the original acidity on the third day. From this date onwards it gradually rose, reaching the normal two and a half months later. The quantity of gastric secretion showed a temporary increase, possibly in an attempt to compensate for the diminution in the acidity, but soon returned to the normal. The subsequent applications succeeded in reducing the quantity and acidity of the secretion almost to nil, but this condition was very transitory, and three weeks after the cessation of treatment, the acidity, and rather more slowly the quantity, rose to normal. The pepsin was also decreased, but more slowly than the acidity, and it rose again to normal more slowly. Histological examination of the diverticulum at the end of the treatment revealed a normal picture and no signs of atrophy. These experiments proved that the X rays have a prolonged action in reducing the quantity and acidity of the gastric secretion, and that in treatment of such conditions as duodenal ulcer, one strong dose is more effective than repeated small ones, as the stomach becomes accustomed to the treatment and the reaction diminishes with the number of applications.

WE deeply regret to learn the death of Sir Alfred Pearce Gould, Consulting Surgeon to the Middlesex Hospital, and late Vice-Chancellor of the University of London, which occurred last Wednesday morning at Ashburton, Devonshire.

THE resumed discussion on Tests of Renal Function takes place at the Section of Urology of the Royal Society of Medicine at 8.30 P.M. next Thursday, April 27th, when Mr. Jocelyn Swan will reopen the debate and Sir John Thomson Walker, Dr. Geoffrey Evans, and others are expected to contribute. We print this week, with additions, the substance of Mr. Frank Kidd's contribution to the previous discussion.

[1] Sitzung der Gesellschaft der Aerzte in Zürich, Feb. 23rd, 1922.

A SCHEME FOR A HOSPITAL SERVICE: POLICY OF THE LABOUR PARTY.

WE commented in our issue of April 8th on a Statement of Policy with regard to hospitals, emanating[1] from the central office of the labour movement. The value of such a statement must depend as much upon the experience and prescience of those who drew it up as upon their ability to influence public opinion. We paraphrase here the last paragraph of the statement setting out the practical steps towards the ideal solution and the summarised conclusions.

Practical Steps towards the Ideal.

As it is impossible to procure the necessary increase of hospital accommodation by means of voluntary contributions, or even to maintain the existing accommodation without financial difficulties, it is inevitable that public funds must be employed in the interest of the health of the nation. The principle that the community is responsible for the health and well-being not only of the community as a whole, but of each of its individual members, has long been established, and the application of this principle is constantly being widened. It is exemplified in all the different health services already controlled and administered by the State and municipalities. Consequently, there would be nothing of a revolutionary character in public funds being granted to provide increased hospital accommodation or to support and maintain the existing voluntary hospitals. The principle is admitted in the Dawson Report, in the Cave Report, and in Dr. Addison's "Omnibus" Bill, but in none of these is it sufficiently recognised that the receipt of public funds must carry with it the right of the public to be represented on the governing bodies. The principle of the use of public funds has been actually put into practice at Barry and Widnes, at Willesden, and, more recently at Bradford, where general hospitals have been established which are controlled, supported, and administered by the local health authorities. Indeed, the very fact that public authorities have become responsible for so many health services makes it imperative that they should have beds controlled by themselves at their command. The lack of these is rendering the school service, the maternity and child welfare service, the tuberculosis service, and the venereal disease service less efficient than they might otherwise be: the possession of beds, on the other hand, has rendered the infectious disease service in every way useful and beneficial to the community.

Acquisition of Poor-law Infirmaries.

The rational transition, therefore, from the present system of voluntary hospitals to an organised public hospital service is for the public authorities to acquire the necessary hospital accommodation for the use of the existing health services, and upon this foundation gradually to build up a complete service for all purposes and for all classes. And the first step towards this is undoubtedly the acquisition of the Poor-law infirmaries. There are in all 92,000 beds in these infirmaries, and it is reckoned that on an average 30,000 of these are empty in the summer months and 20,000 in the winter months. The promised legislation for the acquisition of the Poor-law infirmaries by the local health authorities should be pushed forward so that these empty beds may be utilised. Many of the older buildings will require a good deal of remodelling to bring them up to the standard of a well-appointed general hospital, but the cost will be small compared with new construction. In this way nearly one-third of the necessary additional accommodation can be provided. The general scheme for the internal working of the present large general hospitals, with their special departments and organised coöperation between department and department, is highly efficient, and should be the model on which all public hospitals should be worked.

[1] The Labour Movement and the Hospital Crisis. Published by the Trades Union Congress and the Labour Party, 32–34, Eccleston-square, London, S.W. 1.

There should be a whole-time staff of resident medical officers, composed of junior men responsible to the visiting staff. Probably it will be best, in the first instance at any rate, that the visiting staff should be part-time officers, paid in proportion to the time devoted to their public duties. At Bradford the suggestion is that members of the senior staff shall be expected to give an eight-hour week at a salary of £500 a year; whilst juniors shall give a six-hour week at a salary of £300 a year.

Relation to Voluntary Hospitals.

When the local health authorities have established the nucleus of a public hospital service by taking over and equipping the Poor-law infirmaries as general hospitals for the use of all citizens, they will be in a position to negotiate with the voluntary hospitals. The latter should be given the option of (1) being taken over root and branch by the health authority, or (2) of remaining on an entirely voluntary basis, or (3) receiving subsidies from public funds, conditional on their being maintained at a high standard of efficiency and on the public authority being represented on the governing body in numbers proportionate to the size of the subsidy. Many hospitals exhausted by financial difficulties would most likely be only too pleased to give up the struggle and find rest under the public authority. Many others will probably be forced into accepting subsidies by their financial straits. Those remaining on an entirely voluntary basis will probably be but few. Whatever happens, however, it will be essential that the public and the voluntary and semi-voluntary hospitals should together establish a scheme of mutual aid in carrying out the institutional work of the country. Just as the voluntary hospitals are beginning to coöperate with the Poor-law infirmaries, so must they in the future coöperate with the municipal hospitals, if they have a care for the welfare of the community. This should not exclude a friendly rivalry as to which shall be most efficiently equipped and skilfully administered.

Avoidance of the Poor-law Stigma.

One danger must be carefully avoided. If the voluntary hospitals continue the system of patients' payments, and the public hospitals are free and open to all, which it is essential they should be, there will be a tendency for the former to drift into pay-hospitals for the middle classes and the latter to be used by the necessitous poor only. There will then arise a service for the rich and a service for the poor, which is bad from every point of view, and will entail the risk that in the long run the public hospitals may gather about them all the evils and odium of the present Poor-law institutions. This danger can be entirely avoided by keeping the standard of work in the new public hospitals up to the level of that of the best voluntary hospitals, for it is obvious that if the comfort and treatment are equal no one will be desirous of incurring the extra expense of entering a paying hospital when they can for nothing enter a similar institution, in the management of which they have a voice through their elected representatives. In this way the public hospitals will probably become more popular and more in demand by members of all classes than the voluntary hospitals. Moreover, with the growth of a proper civic spirit the public will be less willing to accept any portion of their treatment as an act of charity from the benevolent when they can provide it for themselves through the rates.

Re-grouping of Hospitals: Receiving Stations.

With the infirmaries transformed into up-to-date general hospitals, working in close coöperation with existing voluntary hospitals, some of the present shortage of hospital requirements will be made good; but even so there must still be a considerable deficiency of accommodation and service; there will still be overcrowded out-patient departments and long waiting lists for admission to the wards, and but little will have been done to correct the present anomalies of the faulty distribution of hospital accommodation. With an efficient nucleus firmly established, these deficiencies can be made good gradually; new construction can be undertaken as opportunity occurs at suitable centres, such as cottage hospitals in small towns and additional county hospitals with all necessary special departments where such are advisable. In some districts the difficulties may be overcome by judicious re-grouping of hospitals and the extension of such of the existing hospitals as would be suitable for county medical centres. The demand on hospitals can also be diminished by the formation of numerous "receiving stations" in outlying districts where out-patient work can be done, and where cases of a doubtful nature can be taken in and observed for a day or two.

The Place of Convalescent Homes.

Hospital congestion may be further relieved by every local health authority acquiring a convalescent home to which patients no longer requiring skilled hospital treatment, but not sufficiently recovered to return to their own homes, could be transferred. Moreover, the admission of many patients on the eve of a breakdown to such homes might prevent the necessity of treatment later, and so diminish the demands on hospital accommodation. For such convalescent homes, which need not be in cities, many of the country mansions which are constantly coming into the market could easily be adapted. They could be provided at far less cost than additional hospital accommodation, their upkeep would be less costly, and the period of convalescence would be shortened by transference from hospital surroundings to country air.

Summary of Hospital Policy.

The statement ends with the general conclusion that the Labour movement, recognising the importance of health to individual and national well-being, considers that all hospitals, both special and general, together with allied institutions, should be so organised under one authority as to form the foundation on which a complete hospital system for the nation with sufficient accommodation to deal with all cases requiring institutional treatment can be built. To attain this it would:

Establish treatment centres in outlying districts, local or cottage hospitals in the smaller towns, one or more county hospitals conveniently situated in each public health area, and national hospitals in London and Edinburgh and other University towns.

Organise intimate coöperation between all the hospitals in each public health area and also between them and the nearest national hospital. It would make arrangements for easy and rapid transference of patients from one hospital to another according to the nature and requirements of the case.

Organise intimate coöperation between the medical staffs of the various hospitals, and also between them and general practitioners, making the participation of the latter an essential feature of the hospital scheme.

Provide the health authorities with sufficient beds under their own control to deal with all patients for whom they have already undertaken the responsibility. (Patients suffering from tuberculosis or venereal diseases; children from the school clinics; mothers and infants from the maternity and child welfare centres; and adults under the National Health Insurance scheme.)

Introduce the necessary legislation for the transference of the Poor-law infirmaries from the guardians of the poor to the local health authorities, thus placing at their disposal many beds now vacant. It would re-model these infirmaries, where necessary, equipping and conducting them in every way on the lines of the best existing general hospitals.

Give voluntary hospitals the option of being taken over by the health authorities entirely, of remaining on a voluntary basis entirely, or of receiving grants from public funds conditional on efficiency and the representation of the local health authority on the boards of management. It would secure close coöperation between those remaining entirely on a voluntary basis and the public hospitals.

Relieve pressure on hospital beds in the cities and towns by acquiring convalescent homes in the country, into which should be admitted cases of threatened breakdown, and patients no longer requiring hospital treatment, but not sufficiently recovered to return home.

Establish free dental clinics connected with all hospitals, believing that supervision and treatment of the teeth are essential to health.

Arrange a scheme for visiting nurses and home helps in connexion with the hospital system, and lays special stress

on the importance of skilled supervision and after-care of patients who have recovered, or partially recovered, from illness.

Make all public hospitals free and open to everyone who would be likely to derive benefit from institutional treatment.

Insist on the treatment offered being equal to that of the best voluntary hospitals in efficiency.

Economy of General Health Measures.

Finally, the acceptance of the "national minimum" and a wise housing policy, including the abolition of slums and all insanitary dwellings, will so far reduce the incidence of tuberculosis and perhaps epidemic diseases that many of the municipal sanatoriums and some of the isolation hospitals will become available for general hospitals or for convalescent homes for the relief of hospital congestion. In all these ways a complete and efficiently organised public hospital service can be gradullay built up. It can be done so gradually that the cost will hardly be felt. At the present time the loss of wealth through loss of production due to insufficiency of hospital accommodation and the long waiting lists is enormous, probably amounting to many millions of pounds a year. The saving of this alone in one year would probably defray the cost of all necessary new construction, and the annual saving would more than cover the cost of upkeep and maintenance.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

Dr. Schrötter on Rhinoscleroma.

AT a recent meeting of the Vienna Laryngological Society, Dr. Schrötter, the son of the late famous pioneer of laryngology, read an interesting paper on rhinoscleroma, illustrating his lecture with a large number of lantern slides taken from the few existing English, Russian, and German standard works. The disease is defined as a chronic infection by an encapsuled bacillus, attacking the upper respiratory tracts (including the trachea) and causing very marked changes in the air passages. It is acquired mostly in early age, is transmissible between human beings by direct continuous contact, like leprosy, although the latter may be regarded as extinct in Europe. Dr. Schrötter showed pictures of cases observed for more than 30 years, showing the marked infiltration, with the later stenosis and disfigurement so characteristic of this disease, terminating in atrophy and destruction of the specific tissue. He emphasised the necessity of further investigations into the method of transmission and the contagiosity of the disease, and of bringing statistics up to date. The official European figures relating to the disease reached only up to the year 1910. The lecturer said that he was sent during the war into the centre of the Eastern European infected areas by the united Austro-German Rhinoscleroma Committee, and in 1914–17 visited Poland, Russia, Galicia, Roumania, and other Balkan countries, as well as that part of Italy which was occupied by our armies. Other areas where the disease is known—Hungary, the Baltic provinces, and parts of America—he had not been able to visit. He felt it his duty to call attention to the danger arising out of the increasing emigration from infected districts. Prophylactic measures were necessary to prevent the spread of the disease into countries hitherto free from it. He named South America, and the Argentine ambassador, Dr. Perez (himself a well-known rhino-laryngologist and discoverer of the *Bacillus ozænæ*), who was present at this meeting, suggested that at the coming international health conference at Warsaw, the necessity for international consideration of rhinoscleroma should be pointed out. He suggested Vienna as the most suitable place for a conference on the subject. Dr. Schrötter also remarked that therapeutic results were hitherto rather nugatory, as operations did not prove as effective, in the cases observed for a sufficiently long period, as might have been expected at the beginning. Serum treatment worked out on modern lines might prove much more beneficial.

Endangered Existence of the Vienna Lupus Institute.

A moving appeal to the public has been issued on behalf of the Vienna Lupus Institute, the work of which is threatened with complete cessation owing to lack of funds. The institute is justly regarded as one of the few assets remaining to the Austrian republic, which have no rival on the continent. Springing from its insignificant beginning as a purely charitable undertaking about 18 years ago, its work and scope steadily increased, and in 1908 it was able to settle in specially designed and excellently-equipped premises of its own, situated on high ground, and covering an area of 24,000 square yards. Of this space only 2500 square yards are built upon, the remainder consisting of beautiful gardens. The air is bracing, and the sunlight the maximum obtainable in Vienna. The building, of white brick, contains six large sets of Finsen apparatus, each consisting of four lamps, admitting of synchronous treatment for 24 patients—i.e., about 200 can be treated per day. The building is three stories high, and contains a modern operating theatre, two dressing-rooms for post-operative work, an X ray outfit, both chemical and microscopical laboratories, and a disinfection plant. For the treatment of mucous membrane, eyes, nose, throat, there are special arrangements of the most up-to-date nature; radium and quartz lamps treatments are both provided for, and bathing arrangements on an ample scale are also present. A roof-garden for open-air treatment on the lines worked out by Dr. Rollier, of Leysin, Switzerland, is used chiefly for children, who number about 15 per cent. of the total patients.

The normal capacity is 100 beds, and now no fewer than 131 persons are housed there, showing how urgent is the need not only for the mere continuation of the institution but for its extension. Since its opening in 1904, 11,316 individual patients have been treated; of these 690 attended in 1921, amongst them being 99 children under 14 years. Forty-two per cent. of the total were males; 64 per cent. were cases of lupus, the remainder being dermatoses of other kinds. Plastic operations are a special feature of this institute; over 890 were performed in 1921. The board is now attempting to collect a large quantity of statistical material, by asking former patients to apply for re-examination and control. Excellent results are obtained in the Finsen department in cases of trachoma; a few sittings of 10–20 minutes each are sufficient to obtain a rapid cure. Lupus erythematosus comes next, whilst true lupus necessitates many sittings of between 50 and 80 minutes. The lupus cases under observation in the institute show that this disease is already observed in 3 per cent. of the patients in the first year of life. Twenty per cent. of all patients were first attacked at ages below 18 years; lupus rarely sets in after the forty-fifth year of life, although six cases were noted in which it began at the ages of 68 and 72. No hard-and-fast rule can be worked out as regards the influence of occupation on the onset or development of disease. The patients hail from all levels of society. Among them there are two physicians; domestic servants, barristers, business men, agents, teachers, peasant girls, nurses, artists, and stock-brokers are all represented. Nearly all nations and races are found amongst the patients—negroes and an Indian, Turks, Chinese, Greeks, Egyptians, Italians, besides, of course, inhabitants of Central Europe. A large number of patients are now attracted by the "artificial nose," a special feature in the work of the institute. The hideous disfigurement so often noted in patients suffering from lupus of the face and nose, is covered by a special composition of wax, modelled to make an excellent substitute for a natural nose. It is very elastic, has a melting point of about 140°–160° F., is coloured in a most artistic way, and

can be worn with greatest ease. Patients are taught to make the noses for themselves, as they must be frequently renovated. This nasal prosthesis is being worked out in a special department recently added to the institute. In pointing out all the work done during the last two decades the board of management turns to the public for help: the Government alone cannot do all that is required, as the institute is entirely a private and charitable enterprise.

Suicide, Hydrophobia, and Scurvy in Vienna.

Health statistics for the first quarter of 1922 show a marked increase of suicides in the city, especially amongst the females; after a reduction during the last four years, the number of attempts at self-destruction is now near the pre-war level again. Mental instability, due to the conditions of present-day life, is responsible for the majority of these cases. Some persons developed hydrophobia after being bitten by rabid animals. Some time ago a stray dog attacked a number of other dogs, and before he was killed numerous animals over a wide area in Vienna were infected. Public attention was drawn to the outbreak and warnings were issued by the Board of Health and the veterinary authorities. The Government laboratory, which will examine any material suspected of rabies, is now open to all applications, and the institute for prophylactic vaccination against rabies is prepared for all emergencies. Scurvy has appeared in a children's home. At a recent meeting of the Medical Society, Prof. Knöpfelmacher demonstrated six children, all showing severe degrees of this condition, traceable to the unsatisfactory condition of feeding—i.e., lack of green vegetables, fruit, and meat. The children were mostly fed on tinned or potted articles, with no potatoes or fresh milk. In conjunction with these findings, the Medical Society presented a memorandum to the Government, asking the latter to permit the importation of lemons, oranges, and other raw fruit which have been regarded as luxuries and kept out of the country because of the exchange value. The importation of fruit is now again permitted, and the population is readily taking advantage of this valuable addition to its diet.

April 8th.

BUDAPEST.

(FROM OUR OWN CORRESPONDENT.)

The Value of Tuberculin Reaction.

AT a recent meeting of the Budapest Inter-Hospital Association, Dr. Schmidt upheld the view that the tuberculin reaction is very valuable, though not infallible, in the diagnosis of tuberculosis. His technique is as follows: After absence of fever has been assured, for several days by four-hourly measurements, 1 mg. of tuberculin in fresh solution is injected; after from four to five days, 5 mg. are injected. Of eight cases with positive reaction, tuberculosis was found at autopsy in five; in three carcinomata of œsophagus and stomach were the sole lesions. In one there was no reaction, although tuberculosis was evident. Despite the small doses and great care in their administration, serious accidents may occur and a latent process may suddenly become active, even leading to a rapidly fatal issue. This happened in three of Dr. Schmidt's cases—one of leprosy combined with tuberculosis, one of incipient apical tuberculosis, and one of affection of the serous membranes. A source of error is to be found in hysterical patients, who sometimes react after injections of plain water.

Acute Articular Rheumatism in Children.

Dr. Schiff, who has made a close study of the occurrence of articular rheumatism in children, states that in the literature he has found that numerous authors have reported cases of this sort in very young children. Possibly the disease is transmitted with the milk of the wet-nurse. The incubation period in such cases is at least four days, the duration of the disease between two and four weeks: both duration and severity are less in infants as compared with adults. In the former it may run its course without any complications, while in older children endocardial and pericardial complications, as well as implication of the pleura and nervous system (chorea) are of frequent occurrence, as observed by Bandelocque, Rilles, Bartex, and others. Picot found 50 per cent. of his cases complicated with pericarditis, while Roger asserts positively that every rheumatic child's heart is bound to be attacked sooner or later. Dr. Schiff observed in one case a rather rare complication in the form of an effusion into the maxillary joint.

Local Anæsthesia with Tonogen-Cocaine.

Dr. Fleischmann uses tonogen, a Hungarian preparation, a substitute for adrenalin, with cocaine for local anæsthesia. The mixture is made as follows: To a 5 per cent. solution of cocaine hydrochlorate he adds a 1 in 1000 solution of tonogen in the proportion of 2 drops to each c.cm. of the cocaine solution. He employed this mixture for local anæsthesia in 87 cases, including lipoma of the external genital organs, phlegmon, epithelioma of the right cheek, cancer of the lower lip, chronic ascites of the ovary, atheromatous tumours of the forehead, and fistula of the lower jaw. Complete anæsthesia was induced in all these cases, with entire absence of any parenchymatous hæmorrhage, the anæsthetic effect being observed also on the diseased tissues. Dr. Fleischmann failed to observe any harmful effects of the mixture on the course of healing, nor were there any immediate toxic symptoms, with one exception. Anæsthesia began ten minutes after the injection, and lasted for almost two hours, enabling the operator to stitch up the wound painlessly. In operating on deep tissues it is preferable to use weaker solutions of cocaine, but in greater quantity. We note that caution is advised in old people and children. It is a mistake to assume that local anæsthesia may only be employed in so-called minor surgery, for at a recent meeting of the Budapest surgeons the successful use was reported of local narcosis in such capital operations as hernia, appendicitis, and laryngeal growths.

Status Lymphaticus in Adults.

Dr. Major, having noted the high percentage of mortality among cases of meningitis, enteric, and septic infections, presenting physical marks of status lymphaticus, with confirmatory pathological findings, tested the reliability of the various criteria whereby a classical case of status lymphaticus may be recognised. Of 300 men attending the alcoholic wards of the City Hospital, 249 were without any stigmata or abnormal physical characteristics, while the remaining 51 presented physical attributes sufficient to identify the condition. The main points (as already described by Emerson in New York) of variation from the usual masculine physical habit justifying a diagnosis of the condition are: Scantiness of hair on lips and chin and in sternal and axillary regions, with feminine type of distribution, with or without scantiness of pubic hair; a tendency to narrowness and length of thorax; a noticeable roundness and arching of the thighs and roundness of the upper arms; smallness of the penis, pointed shape of the glans; and smallness of the testicles. A velvety and delicate texture of the skin is also noticeable. Of all autopsies performed in the pathological laboratory of the Budapest University in 1920, about 7 per cent. were cases of status lymphaticus, almost all associated with infectious diseases, so that it must be concluded that such individuals are more susceptible to the dangers of infectious disease. And they cannot tolerate as well as normal subjects fatigue, shock, loss of blood, or abuse of narcotic drugs. Among the ordinary pauper class, in the general wards of the polyclinic, the incidence of this condition of status lymphaticus is less than a quarter of that found among the alcoholics among whom the above observations were made.

April 1st.

MEDICINE AND THE LAW.

THE ARMSTRONG CASE.

Herbert Rowse Armstrong was convicted last week and sentenced to death for the murder of his wife, after a trial which, from opening to close, attracted profound public attention. It is not necessary to recapitulate the story of Mrs. Armstrong's illness and death, or to do more than point out that the medical evidence was of absolutely vital importance in deciding the issue. There was no witness who could depose to any action on the part of the prisoner in the nature of administering to the deceased food or drink capable of containing the arsenic of which she died.

There was some conflict of scientific opinion between the Crown medical witnesses and those called for the defence, but the medical men who attended the deceased in her lifetime testified in accordance with the opinions and actual findings of the former witnesses, and this fact, combined with the facts deposed to by the lay witnesses, left no doubt as to the guilt of the prisoner on the jury's mind. To one point in the medical evidence given before the magistrates only, and not repeated in the assize court, we would, however, call attention, without forgetting that a right of appeal still remains to Armstrong. Dr. Hincks was questioned in the preliminary stages as to his having treated Armstrong for venereal disease, and, after protesting against being compelled to reveal the secret of a patient, he admitted that he had done so. It is satisfactory to observe that the Attorney-General did not think it necessary to ask for this evidence, because unless it is clear that the administration of justice will suffer thereby, it is in the last degree undesirable that the confidences of a patient should be brought to light even in a court of law. It can, however, hardly be said that such evidence, if given, could not have been made relevant. This being so, we are glad to see that Dr. Hincks was not obliged to give evidence regarding information obtained in his professional capacity; but we recognise that it might have been his bounden duty as a citizen to do so.

Out of the evidence of Dr. Hincks another point arises of public as well as medical importance. When Mrs. Armstrong died he gave a certificate in which he stated as the cause of death heart disease, neuritis, and gastritis. It was not necessary for him to be satisfied as to what might have been the primal origin of the symptoms which he had personally observed in order that his patient should be decently buried in accordance with the law of the land. He had, of course, no reason to suspect that symptoms which might have been caused by arsenic were in fact due to that poison. There was nothing whatever in any of the circumstances to raise the suggestion. This example of what may, but probably does not often, happen adds support to the contention that our present system of death certification and registration as antecedent to burial requires re-casting in the interest of the public safety.

The symptoms accompanying death caused by certain poisons do not differ from those which may be caused by natural disease. Many years ago, commenting upon a letter from Sir Henry Thompson which had appeared in the *Times*, we said in these columns: "If the registration of death were entrusted to the care of some specially qualified person, such official might be supplied with formulæ for interrogation, the use of which would enable him to detect an attempt to deceive, or to correct an error from inadvertence or carelessness." And in the same issue, that wise critic of all our regulations in respect of death certification, the late Dr. F. W. Lowndes, criticised in detail the Coroners Act of 1887, and pointed out that the law provides for cases in which there is no doubt that a perfectly natural death has taken place, and for those in which quite obviously there ought to be an inquest, but added that there was no direct authority whatever afforded by the law to guide the medical man in that intermediate class of deaths in which he might feel a doubt as to whether he ought to certify or not. The doctor is liable to a penalty for a false certificate, or for withholding a certificate without reasonable excuse. His decision may be adversely criticised by a coroner, or by a coroner's jury. He may offend or distress relatives of the deceased; and whatever course he adopts, he will be able to point to no law authorising or ordering him to act in that particular manner. The proceedings instituted for securing the thorough investigation of the cause of death before cremation might find their counterpart before burial. The whole matter is eminently one for the public to consider. The changes, thus suggested, might not lead to the detection of many cases of murder by poisoning, for the excellent reason that the certainty of inquiry would have a deterrent effect and would tend to prevent poisoning being undertaken.

Once again a tragedy has brought to the front the ease with which the public can obtain large supplies of deadly poisons.

[1] THE LANCET, Nov. 12th, 1892, p. 1054.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Lieut. E. B. Kelley to be Surg. Lieut.-Comdr.

The following appointments have been made: Surg. Comdrs: T. R. L. Jones to the *Vivid*, for R.N. Hospital, Plymouth; J. H. Lightfoot to the *Vivid*, for R.N. Barracks, Devonport; J. McCutcheon and L. Warren to the *Victory*, for hospital ship *Maine*; G. B. Scott to the *Iron Duke*; and J. O'Hea to the *President*, addl., for R.N. Recruiting Headquarters.

ROYAL ARMY MEDICAL CORPS.

Capt. J. Stephenson is placed on the half-pay list on account of ill-health.

The undermentioned temp. Capts. relinquish their commns. and retain the rank of Capt.: H. G. Jamison, J. Cameron, C. G. Monro, W. J. G. Gayton, G. Walker, and J. R. Rygate.

ARMY DENTAL CORPS.

Lt. (temp. Capt.) P. P. Hogan to be Capt.

TERRITORIAL ARMY.

Lt.-Col. J. Young, having attained the age limit, is retired and is granted the rank of Col. with permission to wear the prescribed uniform.

Maj. J. M. Smith resigns his commn. and retains the rank of Maj.

Capt. L. Colledge resigns his commn. and retains the rank of Capt.

The undermentioned officers relinquish their commns. and retain their rank, except where otherwise stated: Majs. O. R. Ennion and B. E. Potter; Capts. E. Babst, M. Brennan, L. West, and E. N. Butler are granted the rank of Maj.; Capts. J. R. Bulman, W. T. Crawford, F. J. Davidson, V. T. Ellwood, H. F. G. Hall, J. J. Hummel, G. H. Harper-Smith, G. Johnston, J. D. Jones, W. K. Legassick, D. F. Macrae, R. J. R. Mecredy, S. K. McKee, D. F. Torrens, E. N. Aubrey, N. R. Williamson, and H. Whitaker.

TERRITORIAL ARMY RESERVE.

Capt. T. W. Morcom-Harneis, having attained the age limit, is retired and retains the rank of Capt.

ROYAL AIR FORCE.

R. H. Wace is granted a temporary commission as a Flight Lt.

INDIAN MEDICAL SERVICE.

The King has approved the retirement of Lt.-Col. E. J. O'Meara.

The Board of Admiralty have decided that Medical Officers who were granted temporary commissions as Surgeon Rear-Admirals and Surgeon Commanders during the war, and whose commissions did not terminate before Nov. 11th, 1918, are entitled to retain their rank and also to wear the uniform of that rank on State and other occasions of ceremony within the British Empire. The dresses and occasions on which they are to be worn will be found on pp. 2301–02 of the Quarterly Navy List.

Dr. C. Sigalas, professor of pharmaceutical medicine in the University of Bordeaux, has been re-elected Dean of the Faculty of Medicine.

Public Health Services.

THE STATUS AND SALARY OF THE MEDICAL OFFICER OF HEALTH.

THE enactment in 1921 of the Public Health (Officers) Act, which came into force on April 1st of the present year, coupled with the Sanitary Officers Order, 1922, recently issued by the Ministry of Health, to take effect from the same date, give for the first time to whole-time medical officers of health that security of tenure of their appointments, the absence of which in the past has subjected the progressive officer at times to the drawbacks of an ambiguous position. The medical officer has in many areas been liable to summary dismissal by an authority outraged at some indictment on his part of local affairs; though such treatment has occurred but rarely its possibility has certainly tinctured official life. Now such dismissal can take place only with the consent of the Ministry of Health. And in respect of part-time medical officers of health there is also a distinct improvement in the terms of appointment, under the new enactments, although the security of tenure is here, as would be expected, not so complete.

Medical officers of health may be congratulated warmly on material improvement in their positions, though we gather that in some respects their status is still not established with sufficient firmness. The medical officer of health is the responsible adviser of the local authority on all matters affecting the public health, and should not be in an inferior position financially, on the one hand, to other responsible heads of departments under the local authority, or, on the other hand, to the senior members of his profession in practice in the area. It is, of course, uncontradicted that the medical officer of health's salary is on an average low in comparison with the earnings of the more prosperous practitioners of his district.

But it is only the publicity given to several recent appointments which has made it evident to the general public that the medical officer of health, even though his service status may be acknowledged in principle by the local authority employing him, does not in the majority of cases receive emoluments corresponding with his true position. The glaring instance of a northern town of over 400,000 inhabitants has been quoted in the press, in which the medical officer of health, responsible for the maintenance of health, receives less than £1000 a year, while the gas manager receives over £2500, and the sewage manager and the chief constable over £1100 each. This is by no means a solitary instance of underpayment, though doubtless a somewhat extreme one. In the eyes of the average man of the world the status of an appointment can be measured roughly by the salary attached to it. There can be no doubt that the Public Health Service is seriously handicapped by the inferior status implied in the low salary so commonly paid to its members. It is unfortunate, but by no means surprising, that under the circumstances there should have been of late a movement to discourage in the medical schools the entry of students into the field of public health, on the ground of its unattractive financial outlook. It would be a serious blow to the physical welfare of the country if that movement were to develop any degree of momentum. We would appeal to local authorities to take a long view of their responsibilities in the matter.

Members of the public health service have been further disconcerted by the attitude of the Ministry of Health towards certain recent appointments, in which it has approved such salaries as £600 for Stafford, and has regarded £1200 as too high at Camberwell, and £800 too high for a maximum salary for a tuberculosis officer at Southwark. It is, perhaps, natural that the present stress should have driven the Ministry to adopt this attitude, but its effects may extend over a period much longer than is likely to be attained by the present financial depression.

THE FIRST NEED OF THE INSURANCE MEDICAL SERVICE.

An indispensable condition for the attainment of an efficient insurance medical service, after the personality of the practitioner himself, is a proper environment for him to work in. What are now the means at his disposal? In season and out of season the medical profession has urged the completion of the service by the establishment of clinics and laboratories, and by the provision of hospital beds. At present the service is stunted. Serious cases are dealt with in hospital either as an act of grace by surgeons on the staff, or, if by the insurance practitioner himself, it is without any provision for remuneration, even of the anæsthetist. Hospitals have constantly to complain that they are treating insured persons without adequate payment, a case in point being the Royal Northern Hospital at Holloway, where the chairman recently stated that the contribution during the year from approved societies towards the support of in-patients had amounted to four guineas. Obviously, the hospitals must be linked up with the general practitioner service through the primary treatment centres, as suggested in the Dawson report. Consultation centres are required in densely populated areas, with facilities for X ray examination, and the services of pathologist and bacteriologist should be ever ready. These are advances which approved societies would do well to urge upon Parliament, for such facilities would not only ensure good work in the service, but would also attract the best men. The Labour Party's scheme for hospital service (see p. 808) urges the foundation of a complete hospital system for the nation, with sufficient accommodation to deal with all cases requiring institutional treatment, and no one is more conscious of the urgency of this need than the insurance practitioner in a crowded area. Why, it may reasonably be asked, does not somebody get on with it? Why are the political activities of the approved societies not turned in this direction? Maybe they are waiting for the long-promised inquiry into the working of the Insurance Act. Insurance practitioners certainly have nothing to fear from such an investigation, which would reveal the extent of their difficulties and the urgent need of remedying deficiencies in the service.

SCHOOL MEDICAL SERVICE IN BIRMINGHAM.

The annual report issued by Dr. G. A. Auden states that last year 49,319 children were medically examined. The number of examinations in schools for verminous conditions was 226,129. The total number of spectacles provided was 2933. The dental surgeons inspected the mouths of 52,219 children, of whom 39,226 were referred for treatment and 23,150 were actually treated. The trade depression, the coal strike, and other untoward social conditions were reflected in the number of meals given to necessitous children—namely, 1,234,854. Dr. J. B. Lowe had carried out a comparative inquiry into the influence of general environment and home circumstances upon the nutrition of children. There was also an inquiry as to the influence of "summer-time" upon the health of children. The general opinion was definitely in favour of the Act, and it was believed that the supposed untoward results were largely hypothetical. The special schools medical officer examined 883 children, and the number of defects referred for treatment was 205 and the number needing to be kept under observation was 459. There was still insufficient room in special schools for the mentally defective. He calls attention to the absence of any definite scheme of research to determine the cause of mental defect, and suggests that a number of lower-grade children should be admitted to the children's hospital for complete clinical, biochemical, and pathological investigation. The valuable help given by the Children's Country Holiday Society deserved special recognition, 1520 children being dealt with.

Correspondence.

"Audi alteram partem."

DENTAL SEPSIS AND GENERAL DISEASES.

To the Editor of THE LANCET.

SIR,—Judging by the numbers of edentulous mouths, it seems to have become the custom to advise a wholesale extraction on the appearance of any general disease of which the pathology is obscure. In no condition is this habit more pronounced than in the group of diseases comprising arthritis, rheumatism, and neuritis.

The leading article on this subject in your issue of April 1st is most timely in its plea for an effort in the direction of more convincing pathological proof, before a patient's teeth are condemned. May I support that plea strongly, at any rate in regard to these particular diseases, on the ground that it is quite a small percentage where troubles are due to the teeth alone, and by no means a large percentage in which dental infections play any part whatever. In support of this statement the following considerations should carry weight.

During the treatment by vaccines of over 500 cases of fibrositis, arthritis, and neuritis, one obtains a fair insight into probable bacterial causes. Rather more than half these cases were treated pre-war; the remainder more recently. Now before the war I never took any precautions as to teeth, except to send patients with caries or pyorrhœa to a dentist to have their mouths attended to, and in *none* of my cases were teeth removed for the disease, but only for obvious dental defects. Vaccines were hardly ever prepared from the gums or teeth. The only ones I did prepare were complete failures. The vaccines (both autogenous and stock), which were clearly effective, were prepared from streptococci isolated from the urine, and in rheumatoid arthritis, micrococcus deformans vaccine. The urine does occasionally harbour oral streptococci, so that these undoubtedly were used in the treatment of some cases. The results I have no hesitation in saying were quite good. The post-war cases extended over a period more or less co-terminous with the boom in wholesale dental extractions. During this period practically all patients who had any teeth were radiographed, and a good many apical infections extracted and carefully cultured for purposes of vaccine therapy. The results on the whole tend to discount very largely the importance of apical dental infections in these diseases; fæcal streptococci are much more frequently causative in these diseases, as Dr. N. Mutch has recently said in your columns.

May I bring forward a method of dealing with the teeth in general disease? Let us suppose that a radiogram discloses several apical granulomata—which by the way, is surely a more accurate name than "abscesses," as in point of fact there is very seldom any obvious pus in these infections. I have one tooth only, extracted under local anæsthesia and with much care to avoid mouth contamination as far as possible. This is cultured and a vaccine prepared. The culture is always made on the media which was shown to the Pathological Society a year ago, and is described in the *Pathological Journal* (Vol. XXIV., 1921, pp. 361, 362). This method, I believe, ensures a successful cultivation of all the varieties of streptococci found at the root of the tooth—anything from four to a dozen in number. The vaccine is tried on the patient in minimal doses, and if there is no reaction at any time to a dose of one or two million the teeth may be excluded as the cause of the general disease. This brings me to the criterion which I rely on for determining the real infecting focus. It is the specific effect of a minute dose of vaccine. If a small dose of dental streptococci has no effect whatever, and on the other hand from 0·1 to 0·5 of a million fæcal streptococci, not once but several times, is followed by a flare-up of joints or muscular stiffness, together with a drop in weight of a pound or two lasting several days, the inference can be safely drawn that in such a case the teeth are not to blame. By this method one not only saves the patient useful teeth, but also avoids the danger that a wholesale extraction may be followed by a flare-up of the whole disease. An untoward event which may take months to subside or may never subside. A few patients have given a history of the serious symptoms of their disease having set in after a wholesale extraction. It is a very real danger.

Taking the specific effect of a minute dose of vaccine as a criterion of pathogenicity, in default of a better method, the last 160 odd cases of arthritis, fibrositis, and neuritis treated show clearly the comparatively small part played by dental infections. I could only find 7 cases of arthritis out of 153 and 3 of sciatic and brachial neuralgia out of 10 in which the teeth were the cause and the sole cause. In 2 more cases removal of teeth had been followed by a flare-up of the joints. But I venture to suggest that this does not necessarily mean that the teeth were the cause, but only that the resistance of the patient was lowered to his microbes by the operation. A case in point: A girl who had suffered for years and was nearly a complete cripple from arthritis had most of her teeth removed a few months before I saw her, and had been much worse ever since. No vaccine really helped her, including a dental vaccine prepared from one of the two or three teeth still remaining in her head, until an autogenous fæcal streptococcus vaccine was given, when steady improvement set in. From the course of this case I have no hesitation in asserting that fæcal organisms were the main cause.

In 44 the dental condition was undoubtedly contributory, though in several of these the only indication was a relapse after apparent cure which cleared up on extraction of the infected teeth plus a dental vaccine; 16 of these were cases of rheumatoid arthritis. In 14 cases there was no evidence for or against. Of the remaining cases 24 had apparently sound teeth. Practically all were radiographed. All did well without dental vaccine. Twenty-nine had all their teeth out long before they developed any symptoms. Nineteen had had their teeth removed, mostly a clean sweep as a remedial measure without benefit or the reverse—these reacted to small doses of other vaccines. Two had pyorrhœa and apical infections. After extraction of the apically infected teeth and vaccines the mouth condition cleared up, but the arthritis remained unaltered. Four had pyorrhœa and general oral sepsis. The arthritis cleared up under fæcal and other vaccines. No treatment was accorded to the mouth at all. In 2 teeth dropped out from pyorrhœa before the disease began. Finally, 3 cases remained in whom apical infection was present in a marked degree. The offending teeth were removed two or three at a time, and cultured. The result of this, plus vaccines, on the arthritis was nil. In 2 of these cases arthritis cleared up rapidly on using other vaccines.

Now, Sir, out of 163 cases only 10 were wholly due to the teeth; in other 46 the teeth were probably contributory. That is, 33 per cent. in which the teeth had anything whatever to say in the matter, whilst only in 6 per cent. were they the real and undoubted cause. I would, therefore, advance the claim that the rôle of dental infection in arthritis and rheumatism is a very secondary one. In view of these findings, may I urge that the proper method to pursue, where the teeth are suspected of being the cause of general disease, is the removal of one tooth proved radiographically to be infected and the administration of a vaccine prepared from this tooth? Then the extraction of not more than two teeth at a time later on. These teeth must be definitely proved to be granulomatous. It should be a rule never to extract useful teeth unless grossly infected at the root, and I would suggest that our dental colleagues are better judges of the dental condition than we ourselves.

I am, Sir, yours faithfully,

H. WARREN CROWE, M.D. Oxon.

Harrogate, April 13th, 1922.

THE ELIMINATION OF ARSENIC.

To the Editor of THE LANCET.

SIR,—The toxic effects following the administration of arsenic have recently attracted the attention of the medical profession, and the following facts which have recently come under observation seem worthy of notice.

Six weeks ago I was invited by my colleague, Dr. D. Lees, of the venereal department, Royal Infirmary, Edinburgh, to see one of his patients, under treatment as an in-patient for syphilis. I was asked to see him on account of the development of very severe anæmia, and slight jaundice, accompanied by a palpable enlargement of the liver and spleen. The patient, a young man, had been under Dr. Lees's observation from Nov. 8th, 1920, to the present time, first as an out-patient and for the previous two months as an in-patient. Between Nov. 8th, 1920, and Jan. 28th, 1921, the patient had ten injections of N.A.B., a total of 3·9 g. of 914 having been given in 81 days. Small doses of mercury and opium were administered in pill form for eight weeks, from March to May, 1921, and again from June to September; no arsenic in any form had been administered for the previous 15 months.

The examination of the blood showed a typical picture of a pronounced, so-called primary anæmia. The question aroseas to whether this condition was. (*a*) the direct result of the syphilis, (*b*) the result of the medicinal treatment, or (*c*) independent of either condition; and he was transferred to my ward for further investigation. The first explanation was considered unlikely in view of the treatment that had been carried out. The third was, under the circumstances, also regarded as improbable. In view of the interest attaching to the second hypothesis, a careful chemical analysis of the stools and urine was made by Mr. Kumack, head of the chemical department of the Royal College of Physicians Laboratory. Both excretions gave a positive qualitative test for arsenic. Three weeks later the excretions were again examined, the result in the case of the fæces being again positive and the urine negative. The observations will be repeated later. Coincidently there has been a marked improvement in the general clinical condition of the patient and in the state of the blood. The striking delay in the elimination of arsenic is of interest; so far as I know, it is not in agreement with the ordinarily accepted teaching on this subject.

I am not aware of any literature on this subject, but would be grateful for any information from any of your readers which might throw some light on these interesting facts.

I am, Sir, yours faithfully,

Edinburgh, April 15th. CHALMERS WATSON, M.D.

ALKALIPENIA.

To the Editor of THE LANCET.

SIR,—I have read with interest the paper by Dr. A. D. Symons on alkalipenia in THE LANCET of April 1st, more especially with regard to his views on the relation of protein sensitisation to depletion of alkali reserve and ketosis. The relative frequency of the occurrence of protein sensitisation and ketosis and the comparatively grave prognosis of diabetes in children together with the similarity of the nature of ketogenic and asthmogenic agents, be they inhaled, ingested autogenous or the result of bacterial or other activity are very striking and provide a fruitful field for investigation. The nomenclature of the various alterations occurring in the alkali reserve of the body has undergone such frequent changes of late that it seems rather a pity to add to the confusion by suggesting yet another one, especially as the nomenclature suggested by the Medical Research Council is the one now almost universally adopted.

Dr. Symons selects as the best definition of acidosis that given by Sellards, which is unsatisfactory in that it includes a condition which is arrived at by an "alkalotic" process—viz., the depletion of alkali reserve by acapnia and compensatory excretion of alkali. A better one appears to be as follows: "Acidosis may be defined as a depletion of alkali reserve due to the presence of excess of non-volatile acids, using non-volatile in the sense that they cannot be excreted by the lungs like carbonic acid." This definition excludes the condition referred to.

Dr. Symons defines alkalipenia as a term intended to convey partial depletion of alkali reserve—i.e., he includes two clinically different conditions arrived at by two entirely different processes—viz.: (1) Compensated acidosis or depletion of alkali reserve due to excess of non-volatile acid; and (2) depletion of alkali reserve through over stimulation of the respiratory centre with CO_2, consequent washing out of the circulation of CO_2, and compensatory excretion of alkali by the kidneys to preserve the normal pH of the blood. The term "compensatory acidosis" which Dr. Symons proposes to abolish served to distinguish these two conditions. Sellards's bicarbonate tolerance test does not appear to be infallible and cannot give as reliable results as estimations of CO_2 content of alveolar air and blood. Palmer, Salveson, and Jackson, who investigated Sellards's test in 1920, came to the conclusion that "it does not admit of estimating with sufficient degree of accuracy the degree of diminished alkali reserve to be of practical value." The cause probably lies in the varying degree of injury to the acid base regulating function of the kidney in disease, and in the fact that in the acapnial process diminution of alkali reserve may occur with alkaline urine as proved by Haldane, Kennas, and Kennaway.

Dr. Symons suggests that the value of the test lies in the fact that it is both diagnostic and therapeutic. It appears to be unwise, however, to administer alkali indiscriminately. For instance, he uses alkali therapy in a case of acute rickets with tetany. It is well established now that tetany occurs in advanced alkalosis. Indeed, it can actually be produced experimentally by giving large doses of sodium bicarbonate or by breathing very low tensions of oxygen. With regard to epilepsy, Dr. William Alexander regards the cyanosis which accompanies the tonic stage as a beneficial act without which epilepsy would be fatal. Dr. Murray Bligh considers the determining factor in relaxing the spasm to be a CO_2 acidosis brought about by the arrest of respiration.

I am, Sir, yours faithfully,

LESLIE CUNNINGHAM, M.B.

Biochemical Laboratory, University of Liverpool, April 8th, 1922.

TONSILS AND ADENOIDS.

To the Editor of THE LANCET.

SIR,—In THE LANCET of April 1st, p. 662, there appears a list of suggestions made by the Council of the Section of Laryngology of the Royal Society of Medicine regarding the treatment of children suffering from tonsils and adenoids. A large number of children receive treatment for throat affections at this hospital, and in the past they have been treated in the out-patients' department as at other hospitals. The committee of management have given this matter special consideration during the last two years, and last autumn took the first step towards improving the conditions by providing an ambulance to convey the children to their homes instead of allowing them to travel in public vehicles shortly after their operation.

The committee have now decided to go much further. On May 1st a special ward of 10 beds is to be opened and will be reserved entirely for the admission of throat cases. The children will be admitted the day before their operation and will stay in hospital three days and three nights, or longer if necessary.

I am, Sir, yours faithfully,

THOS. CLAPHAM, Secretary.

Belgrave Hospital for Children, 1, Clapham-road, S.W. 9, April 11th, 1922.

THE CURE OF A COMMON COLD: A CORRECTION.

To the Editor of THE LANCET.

SIR,—In your issue of April 8th there is a report of the discussion on the above subject at the Medical Section of the Royal Society of Medicine, in which it appears as if I had originated a method of treating a cold by allowing a mixture of paraffin and vaseline to run from a funnel down each nostril. This is not the case. The treatment was devised by Mr. Wilfred Glegg, of Birmingham, as I stated at the meeting. Perhaps you will kindly allow me to make this correction.

In my opinion the treatment is of great value not only in preventing acute infection, but in helping to clear up chronic catarrhal infections of the nose and throat, and, I believe, this is what Mr. Glegg used it for in the first instance. It probably acts by forming a coat over the mucous surfaces, and is much more efficacious than an oily spray, because a much larger dose is employed. Enough vaseline should be added to the paraffin to make a thick viscous mixture that will run slowly out of the funnel. A proportion of 1 to 3 or 4 is about right, but less vaseline should be used in cold weather.

I am, Sir, yours faithfully,
E. P. POULTON, M.D., F.R.C.P.

Cavendish-place, W., April 11th, 1922.

THE COMMITTEE OF INQUIRY ON VENEREAL DISEASE.

THE following correspondence between Sir Alfred Mond, Minister of Health, and Lord Dawson of Penn, chairman of the Medical Consultative Committee, has been received for publication. The correspondence arose from a suggestion by Lord Dawson, in a letter to the *Times*, that the differences of opinion in respect of the control of venereal disease might be cleared up if answers could be obtained to the following questions:

1. What in the present state of knowledge are the most efficient medical measures for preventing these diseases?
2. How far is it ethically justifiable to apply such measures?

Lord Dawson suggested that to answer the first it would be advisable to institute a carefully selected medical tribunal, whose conclusions and recommendations could be submitted to public opinion, then well-informed. The two societies engaged in the solution of venereal problems concurred in this view.

[ENCLOSURES.]

Ministry of Health, Whitehall, S.W. 1,
Jan. 3rd, 1922.

DEAR LORD DAWSON,—I have noted with interest your proposal that a committee of medical men possessing the requisite special knowledge should be constituted to inquire into certain aspects of the problem of venereal disease.

I understand that in your opinion the best hope of solving this complex problem is first to endeavour to secure an authoritative pronouncement on its medical and medico-administrative aspects, the more so as men of eminence hold divergent views upon it.

The community as a whole would then consider this medical pronouncement side by side with the weighty moral and social issues involved, and through its responsible representatives determine the right policy to be pursued.

As Minister of Health I am deeply concerned with this grave problem and write to say that I will afford encouragement and support to the holding of the investigation. That you should gather together a Selection Committee to nominate the members of the Committee of Inquiry would seem to be a sound and practicable method of securing the end in view.

Yours sincerely,
(Signed) ALFRED MOND.

32, Wimpole-street, W. 1, March 31st, 1922.

DEAR SIR ALFRED MOND,—After receiving your letter of the 3rd January I proceeded to take action and with the following result.

The Committee of Selection was constituted as follows:—

Sir Clifford Allbutt,	Sir Archibald Garrod,
Sir Anthony Bowlby,	Prof. Kenwood,
Lord Dawson of Penn,	Sir Norman Moore,
Sir Walter Fletcher,	Sir John Thomson Walker.

This Committee of Selection has secured the services of a Committee of Inquiry which I am sure you will agree is alike strong in the abilities of its members and its widely representative character. The membership of this Committee of Inquiry is as follows:—

Mr. C. J. Bond, F.R.C.S.,	Dr. Dorothy Hare,
Surg. Comdr. Reginald Bond, R.N.,	Prof. Kenwood,
	Sir William Leishman,
Dr. John Brownlee,	Dr. F. N. K. Menzies,
Prof. Bulloch,	Sir Frederick Mott,
Dr. D. S. Davies,	Dr. Sequeira,
Prof. Dreyer,	Dr. Spilsbury,
Col. F. E. Fremantle, M.P.,	Mr. Kenneth Walker, F.R.C.S.

In the opinion of the Selection Committee it is of importance that the Committee of Inquiry should be presided over by a distinguished lawyer, and they have been so fortunate as to secure the services of the Rt. Hon. Lord Trevethin as chairman and Mr. T. J. Tomlin, K.C., as vice-chairman.

The Committee of Inquiry thus constituted has the support and confidence of both the National Council for Combating Venereal Diseases and the Society for the Prevention of Venereal Disease.

The Committee of Selection has carefully considered the terms of reference to the Committee of Inquiry and are unanimously of opinion that the following are both succinct and comprehensive:—

"To consider and report upon the best medical measures for preventing venereal disease in the civil community having regard to administrative practicability, including cost."

This reference has the approval of the distinguished chairman of the Committee of Inquiry.

The Committee of Selection are confident you will share their view that it would be difficult to find a Committee of Inquiry more deserving of confidence and of the support and encouragement which as Minister of Health you have already promised to extend to its deliberations.

We are in complete agreement that after the Committee of Inquiry has reported the community as a whole will have to decide how far its recommendations can be properly made the basis of policy and action.

Yours sincerely,
(Signed) DAWSON OF PENN.

DONATIONS AND BEQUESTS.—Miss S. A. Temple, Redhill, Surrey, by will bequeathed £2000 to the Penrith Jubilee Cottage Hospital to endow two beds in memory of her father and mother; £2000 to Cumberland Infirmary, Carlisle, for two beds in memory of her father; £1000 for a bed in memory of her brother, and the residue of her property, over £6000, to the Penrith Cottage Hospital.—The following donations have been received by the Manchester Royal Infirmary: From Mrs. Joseph Bell £1500 for the endowment of the "Florence Bell" bed; from Mr. O. J. Moseley £101, and just over £300 from other donors.—The following sums from the Manchester and Salford Saturday Convalescent Fund, collected last year, have been allocated: Manchester Royal Infirmary, £1375; Children's Hospital, £611; Ancoats Hospital, £608; St. Mary's Hospitals, £587; Salford Royal Hospital, £530; Royal Eye Hospital, £378; Consumption Hospital, £240, and lesser sums in proportion to the other hospitals and dispensaries. The total sum available and apportioned was £5500.—The late Mr. William Ward, of Mellor, near Blackburn, directed that the ultimate residue of his estate should go to the Blackburn and East Lancashire Royal Infirmary. The amount is £60,000, and will go to the endowment fund of the infirmary.—The late Sir James Edward Jones, of Manchester, left £500 each to the following amongst other institutions: Royal Deaf and Dumb Schools, Northern Counties Hospitals for Incurables, Royal Infirmary and Dispensary in Manchester; and to the following in Rochdale: Adult Deaf and Dumb Society, Rochdale Infirmary, Society for Visiting the Blind, District Nursing Association, Crippled Children's Home.—The late Sir E. Tootal Broadhurst, of Manchester, left £1000 to the Manchester Children's Hospital, and £1000 to the Manchester Invalid Children's Aid Association.—The late Sir Alfred Frederick Bird bequeathed by will £1000 each to the Wolverhampton Royal Orphanage, the Wolverhampton General Hospital, the Wolverhampton Hospital for Women, and the Birmingham General Hospital; £500 to the Wolverhampton Eye Infirmary, £200 to Queen Victoria's Nursing Institution, Wolverhampton; £100 each to the Wolverhampton Refuge, the Wolverhampton Society for the Blind, and the Wolverhampton Deaf and Dumb Institution.

Obituary.

ARTHUR WILLIAM BACOT, F.E.S.,

ENTOMOLOGIST TO THE LISTER INSTITUTE.

FROM Cairo comes the tragic news of the death from typhus on April 12th of Mr. A. W. Bacot, entomologist to the Lister Institute of Preventive Medicine, while he was actually engaged in investigating this disease.

The circumstances are that in response to an invitation from the Egyptian Government in January of this year, Dr. J. A. Arkwright and Mr. Bacot proceeded to Cairo, the research to be carried on not arising from any immediate incidence of the disease but being requisitioned for preventive purposes. Bacot had been working at the time of his infection in the laboratory at Cairo with lice infected from a typhus patient and fed in the laboratory on a typhus-immune nurse. He had also been working with lice infected with a Rickettsia from lice taken from apparently healthy Egyptians. The research was advancing with promise in Bacot's experienced and wonderfully expert hands, and he was most enthusiastic about its progress. But on March 24th he became ill; on April 1st a characteristic typhus rash appeared, and the fatal termination took place on April 12th. It is impossible to say how the infection occurred. The most probable risks would seem to have been in handling the louse excreta. Dr. Arkwright, who is himself also stricken with the disease, had succeeded in infecting guinea-pigs with these, and they contain Rickettsia in large numbers. Bacot, it should be added, in accepting the invitation to go to Cairo must have known his own grave risk. Although not a medical man he was too close a student of epidemiology not to be aware that the prognosis of typhus in a man of his age (he was born in 1866) is unfavourable; but he was the man required, his one interest was his work, and doubtless he counted on his masterly technique to carry him through the dangers.

Arthur William Bacot was educated at the Birkbeck School and studied entomology for many years as an amateur, becoming, in his scanty leisure, a leading lepidopterist, his experiments in breeding being particularly noteworthy; for example, in 1910 he read a paper before the Royal Society describing observations by himself and L. B. Prout upon many generations of a moth—a remarkable exploit of care and resource. Out of these researches his first public appointment arose. In 1910 the Indian Plague Commission requested the Lister Institute to undertake research into the bionomics of fleas, and Bacot was asked to assist in these investigations. Bacot's preliminary work was so good that in 1911 the post of entomologist to the Lister Institute was created, and Bacot was obviously the man to fill it. He responded to the scientific environment and the provision of proper tools for his work in a wonderful way, and his power of assimilating new technical methods might have been envied by many younger men. He worked on plague with Prof. C. J. Martin and with him made the discovery of the mechanism by which infection was conveyed by the flea. Later Bacot proceeded to West Africa and worked on the yellow fever problem, the results being embodied in a masterly report of 191 pages issued by the Commission, and from 1916 he concentrated his energies on the louse, producing several papers of both scientific and practical importance.

In 1920 Bacot went to Poland with the Typhus Research Commission of the League of Red Cross Societies, the report of whose investigations into the mechanism of typhus infection has just been published.[1] The report shows that in the course of his Rickettsia experiments Bacot himself contracted trench fever, so that before the tragedy of his death he had already suffered severely in the cause of scientific progress. During the war he made searching investigations into everything which concerned the prevention or cure of the evils due to lice, and how widespread and potent these were is one of the most sinister recollections of the war. He investigated their methods of pairing, their proceedings when laying eggs, their fecundity and fertility, their length of life, and their general habits, concluding that the circumstances of war, by rendering the washing and changing of garments and bedding an erratic or an occasional proceeding, produce just that low standard of civilised life which conduces to lousiness. Many of his striking experiments were carried out upon his own person, for he standardised insecticides by the suspension between his shirt and skin of gauze packets containing active lice. His methods he described fully before the Section of Epidemiology and State Medicine of the Royal Society of Medicine.[2]

Last year he conducted experiments at the Lister Institute with Dr. J. Ségal on the infection of lice by Weigl's method and demonstrated the technique at a laboratory meeting of the Pathological Section of the Royal Society of Medicine on Dec. 17th, 1921. The technique of this procedure involved the rectal injection of blood in order to feed lice which had been previously infected with typhus, and the dexterity displayed by Bacot will never be forgotten by those who witnessed the demonstration. After immersion in 2 per cent. lysol the louse was transferred to sterile water, then placed on filter paper in Petri dishes to recover. The louse was then held under a slip of paper on a slide on the stage of a binocular microscope at about 16 diameters magnification, with its anal segments projecting beyond the slip. A capillary pipette was then inserted and sufficient whipped human blood injected to fill the stomach. The succeeding details of this experiment will be found in our columns.[3]

Our brief recital is enough to prove how faithful a servant of research was this man, who, up to the age of 45, had worked entirely without help. It is not, we think, rhetorical or exaggerated to say that he, too, died "a very gallant gentleman."

Prof. A. E. Boycott writes: "For the greater part of his working life Bacot was an active and successful member of that body of field naturalists who collect and study the British fauna and flora in the odd moments saved from the strenuous work of earning their living in the commercial world. No one of them showed better what keenness can accomplish on Saturday afternoons and Sundays, and among a mass of more ordinary work Bacot carried out under these conditions important breeding experiments on lepidoptera and made an extensive inquiry into the bionomics of fleas for the Plague Committee. It has been said that it is characteristic of Englishmen that they take their hobbies seriously and not their business. And it might well be thought a dangerous experiment to turn a hobby into business. But when relief came from uncongenial routine clerical employment, in the shape of an appointment as entomologist to the Lister Institute, the hobby was still a hobby in the sense that it was Bacot's serious passion in life, and so it remained till the end. The professionalisation of the pursuit of natural knowledge has been no unmixed advantage; the freer outlook, the vivid keenness, the complete disinterestedness of the amateur tend to be faded and sometimes grow dim. But Bacot preserved in a splendidly stimulating form the best characteristics of the amateur and added to them the system and precision of the professional. Many of his discoveries have been of no little practical moment. He liked to find out things useful to his fellows, but conspicuously in a degenerate utilitarian generation he had the pure love of knowledge which is the basis of genuine attainment. His work on lice in relation to trench fever and typhus will be in many minds when they hear of his death; he would rather

[1] The Etiology and Pathology of Typhus. Being the Main Report of the Typhus Research Commission of the League of Red Cross Societies to Poland. B. S. Burt Wolbach, John L. Todd, and Francis W. Palfrey. Published by the League of Red Cross Societies at the Harvard University Press, Cambridge, Mass.

[2] THE LANCET, 1917, i. 421.

[3] THE LANCET, 1921, ii., 1299.

be remembered as the man who found out that the eggs of gnats will not hatch in quite clean water—a piece of work which may reasonably be suspected of being a really great biological discovery, with a significance much greater than to the particular objects with which he worked. He was one of those rare naturalists who apprehended the place and utility of experimentation in a field where observation has been paramount."

Typhus has many martyrs to its discredit, and Bacot's name is now added to a list which includes the names of Conneff, Cornet, Jochmann, Lüthje, v. Prowazek, Ricketts, and Schüssler.

GEORGE ST. GEORGE, M.R.C.P. IREL., L.R.C.S. EDIN.

Dr. George St. George, of Lisburn, Co. Antrim, surgeon to the County Antrim Infirmary, died suddenly on April 8th, having been in his usual health and actively at work on the day prior to his decease. He qualified L.R.C.P. Irel., L.R.C.S. Edin., in 1871, and became M.R.C.P. Irel. in 1882. He had been associated with the County Antrim Infirmary for the long period of 50 years, and a tablet commemorating his jubilee had recently been erected in that institution. He was also surgeon to the Thompson Home for Incurables, Lisburn. Dr. St. George was a man of many activities. He was chairman of the Lisburn Urban Council, and took an active part in promoting a sewerage scheme for the town. He was interested in temperance work and maternity and child welfare centres, and was a prominent member of the Masonic body, in which he attained the highest offices. During the late war he was closely identified with the Ulster Volunteer Force, and conducted ambulance classes. He was a devoted member of the Irish Church, and held many offices in connexion with Lisburn Cathedral. He was an ex-president of the Ulster Branch of the British Medical Association and an active member of the Ulster Medical Society, to whose proceedings he often made contributions. Dr. St. George was possessed of a genial and courteous manner, and was very popular in his locality. He leaves a widow and a daughter.

Parliamentary Intelligence.

HOUSE OF COMMONS.

MONDAY, APRIL 10TH.

H.S. No. 10 and War Decorations.

Rear-Admiral SUETER asked the Parliamentary Secretary to the Admiralty whether any of the medical staff who served in hospital ship No. 10 had been awarded the 1914–15 star, and if the six civilian attendants who served in the Eastern Mediterranean in this ship were entitled to this star.—Mr. AMERY replied: The naval medical staff who served in the hospital ship *Liberty* (H.S. No. 10) in the Mediterranean in 1915 have been awarded the 1914–15 star. The civilian attendants are ineligible for this decoration, the award of which is limited to the armed forces of the Crown; but those who served at sea in the ship for 28 days during the war period will receive the British War Medal.

TUESDAY, APRIL 11TH.

Medical Officers and the Territorial Decoration.

Sir ROBERT NEWMAN asked the Secretary for War whether, in qualifying for the Territorial decoration, an officer's active service in the recent war counted more than service in peace time towards making the necessary 20 years' service that qualified him for the decoration; and whether the same privilege extended to service in the South African war.—Sir R. A. SAUNDERS (Under Secretary for War) replied: Yes, Sir, under certain conditions such service in the recent war counts double, but this does not apply to service in the South African war.—Captain GEE: Is the hon. gentleman aware that many of these officers, including an A.D.M.S., were civilian people who gave up large and lucrative practices in order to fulfil this engagement with the State which has been broken?—Sir R. SAUNDERS: I am aware that there are certain cases of hardship.

Ex-Service Patients in West Ham Asylum.

Mr. LEONARD LYLE asked the Minister of Pensions to state the actual maladies from which the 61 ex-Service men now in West Ham Asylum were suffering; whether there was any hope that they might eventually regain their normal condition; whether they were periodically examined to that end; whether any of them were disabled; if so, how many; whether they were local men; if so, how often were their relatives allowed to see them; if not, would he have them transferred to a place nearer their own home; and whether any of them were untraced.—Sir A. MOND replied: There are at present 55 Service patients in the West Ham Mental Hospital whose cases may be classified as follows: dementia præcox 23, melancholia 11, mania 4, delusional insanity 6, general paralysis 5, epilepsy 3, secondary dementia 3. About 20 per cent. of these men may be expected to recover, and all cases are periodically examined. Two of the patients are disabled and both are local men. Relatives are allowed to visit on any day, and there is only one case in which no relatives can be traced.

Standard for Imported Milk.

Mr. HURD asked the Minister of Health if it had been brought to his notice that the foreign milk now being imported in various forms was often produced under sanitary conditions which would not be tolerated on British farms; and whether he would safeguard the health of the British consumer, and especially the child population, by instituting a standard for imported milk, whether liquid, dry, or condensed.—Sir A. MOND replied: So far as I am aware the conditions of production of foreign milk which is imported into this country are not worse than those which exist on many British farms. The amount of fresh milk which is imported is insignificant and the processes to which sterilised, dried, and condensed milks are submitted are necessarily such as to minimise the risk of danger to health. All consignments of imported milk or milk products are liable to be inspected at the port of entry, and those which are found to be unfit for human consumption are condemned.

Schick Test Material and Toxin-Antitoxin.

Mr. BROMFIELD asked the Minister of Health whether he had contracted with the Wellcome laboratories for a supply of material for the Schick test for liability to diphtheria and for a supply of toxin-antitoxin for immunising purposes; and if so, what is the cost of this supply and under what conditions are these materials supplied.—Sir A. MOND replied: No contract has been made for a supply of these preparations. In the few cases in which my department have supplied the materials, these have been obtained from the firm in question at the following rates: 12*s.* 6*d.* for 50 doses of Schick toxin, and 40*s.* for 25 doses of toxin-antitoxin mixture, less the usual discount. There are no conditions attaching to this supply.

Certification of Pensionable Disabilities.

Mr. NEIL MACLEAN asked the Minister of Pensions whether he was aware that a number of ex-Service men who were suffering from pensionable disabilities were being ordered to attend their panel doctors; whether this meant that no allowance was paid to them; whether he was aware that these doctors declined to certify the men as fit for work, but certified them as being unable to follow their employment owing to their disabilities; and whether the Ministry paid attention to such decisions.—Mr. MACPHERSON replied: I would remind my hon. friend that under the terms of Article 6 of the Warrant treatment allowances are only payable where, as a consequence of an approved course of treatment which the man is receiving for his war disability, he is unable to provide for his own support and that of his family.

Clothing of Service Patients in Sanatoriums.

Mr. NEIL MACLEAN asked the Minister of Pensions whether he was aware that ex-Service patients who were undergoing indoor treatment in sanatoriums for tuberculosis have to wear their own clothes while in hospital; whether ex-Service men in other hospitals were supplied with clothes for hospital use; whether he was aware that in these sanatoriums men were expected to do certain duties, some of which rendered their clothes unfit for wear outside; and whether he was prepared to consider the supply of clothes to these patients while undergoing treatment in sanatoriums.—Mr. MACPHERSON replied: Ex-Service patients for whom treatment is provided in sanatoriums or other civil institutions at the expense of my department are received on the same footing as civilian patients, and I can see no good reason for differentiating between these two classes of patients as regards clothing.

WEDNESDAY, APRIL 12TH.

Grants to Voluntary Hospitals.

Mr. GEORGE BARKER asked the Secretary to the Treasury if, with reference to the terms and conditions of grants to voluntary hospitals as approved by His Majesty's Treasury,

he would modify the conditions of paragraph 7, which stipulated that grants made by the commission were to be applied wholly to maintenance and in no case to capital expenditure, so that hospitals in course of erection, whose authorities were in financial difficulties, might be able to appeal to the commission for financial assistance to complete the work they had in hand.—Sir A. MOND replied: The Government decided against the proposal of Lord Cave's Committee for a grant in aid of capital expenditure on hospitals, on the ground that the hospitals were not paying their way on the existing buildings, and that it was unwise to build while costs were so high. I can hold out no hope of reconsideration of this decision in present financial conditions.

Post-War Naval Invalids.

Sir THOMAS BRAMSDON asked the Minister of Pensions whether, since the decision of attributability or aggravation of disability by war service, in the cases of post-war naval invalids, was now a matter for the Admiralty, he would, in view of the recent termination of the great war, recommend that all cases of invaliding for the next 12 months, at least, should be automatically reviewed by his department.—Major BARNSTON replied: My right hon. friend regrets that he is unable to accede to the hon. Member's request. Arrangements have been made under which the origin of the man's disability will be inquired into by naval medical boards, and when the man claims that his condition is due to service in the great war his case will be considered by the Ministry of Pensions.

Medical Teaching at London Hospital.

Lieut.-Colonel Sir JOHN NORTON-GRIFFITHS asked the Minister of Health if his attention had been drawn to the report that the authorities of the London Hospital proposed to restrict their medical teaching to men students; whether the hospital received any assistance by way of grant from the public funds; whether such grant was made with or without conditions as to its employment; and whether, seeing that the restriction of medical teaching to male students was neither beneficial to the public health nor in agreement with the principle upon which grants from public funds to quasi-private organisations were made, he would say whether he proposed to take any steps in the matter.—Sir A. MOND replied: The answer to the first part of the question is in the affirmative. The only payments made to the London Hospital from the Ministry of Health Vote are in respect of the treatment of specific diseases. No part of the grant made by the Voluntary Hospitals Commission is applicable to the expenditure of the medical school. I understand that in the opinion of the University Grants Committee, who make certain grants to the medical school, the question of requiring a particular school to admit women students would only arise if facilities for university education in medicine of qualified women students were inadequate. This situation has not arisen in London University.

Nurses and the General Nursing Council.

Mr. ROBERT RICHARDSON asked the Minister of Health whether he was aware that in the reconstitution of the standing committees of the General Nursing Council expert nurses had been taken off, and laywomen of title with no knowledge of nursing, education, or registration had been elected in their places; and whether he would make representations as to the desirability of replacing upon the Education Committee a representative fever nurse.—Sir A. MOND replied: The nurse members of the Council seem to me to be fairly represented on the new committees, and I must demur most strongly to the hon. Member's reference to two ladies who have given much time to the work of the Council during the past two years. Of the nurse members who have ceased to serve on the Registration and Education Committees the only one now in active practice represented fever nursing, and I find that this branch of nursing is already represented on both committees by the superintendent of an important fever hospital. The appointment of committees is wholly within the discretion of the Council, and I do not propose to adopt the course suggested by the hon. Member.

Discharges from Asylums.

Mr. ROBERT RICHARDSON asked the Minister of Health whether, in the matter of dealings with applications for the discharge of patients from asylums, the question was decided by the local visiting committees sitting fortnightly at the asylum and in touch with its inmates, or whether any influence was exercised in this respect by the central London County Council Committee sitting at Arundel-street; and what were the functions pertaining to the latter body.—Sir A. MOND replied: Under the L.C.C. (General Powers) Act, 1915, all the duties of a visiting committee under the Lunacy Acts, 1890 to 1911, in respect of the County of London, are transferred to the L.C.C., but stand referred to the Asylums and Mental Deficiency Committee which meets not at Arundel-street, but at Spring Gardens. All applications for the discharge of patients from the London County Mental Hospitals are considered and dealt with at each hospital by the members of visiting subcommittees appointed by the Asylums and Mental Deficiency Committee for the management of the hospital and by them alone.

Irish Registrar in Lunacy's Pension.

Sir JOHN BUTCHER asked the Secretary for the Colonies whether his attention had been called to the case of Dr. J. M. Colles, until lately registrar in lunacy in Dublin; and whether he could say what security Dr. Colles would have for the continued payment of his pension now that the lunacy fund upon which the pension was charged had been transferred to the control of the Provisional Government.—Mr. CHURCHILL replied: Yes, Sir, my attention has been called to this case and in the improbable event of Dr. Colles's pension not being paid by reason of any neglect or default on the part of the Provisional Government or of the Government of the Irish Free State, he would be entitled to rely upon the assurance given by my right hon. friend the Lord Privy Seal on Dec. 19th.

Silence Rule at Parkhurst Prison.

Mr. ALLEN PARKINSON asked the Secretary for the Home Department if any circular had been recently issued to modify what is known as the silence rule in prisons; if so, could he state the number of hospital nurses that had been charged at Parkhurst prison for allowing patients to break this rule; and whether a fully qualified medical officer or an army officer was in charge of Parkhurst prison hospital.—Mr. SHORTT replied: The answer to the first part of the question is in the affirmative. As regards the second part I am informed that one hospital officer was admonished not long ago for neglect of duty while conversing with a prisoner, but that no other recent cases have occurred. The hospital at Parkhurst is in charge of a fully qualified medical officer, and the whole establishment, including the hospital, is under the control of the governor.

Indian Opium Statistics.

Mr. GILBERT asked the Under Secretary of State for India if he would state for each of the years 1919, 1920, and 1921, the acreage under poppy cultivation in India, the total amount of raw opium produced, the quantity exported, and the revenue derived by the Indian Government from opium.—Earl WINTERTON replied: The following are the latest revised figures: The area under poppy cultivation in British India was 177,124 acres in 1918–19, 163,125 acres in 1919–20, and is estimated at 143,750 acres for one year 1920–21. The area under cultivation in the Indian States has been estimated at 24,871 acres in 1918–19 and 56,934 in 1919–20. In neither case are total figures available for any later period. The total amount of raw opium produced from the area under cultivation in British India was 2,247,081 lb. in 1918–19, 1,876,114 lb. in 1919–20, and is estimated at 1,645,714 lb. in 1920–21. No information is available regarding the total production of the Indian States. The amount of raw opium exported from British India was 14,828 chests in 1918–19 and 10,509 in 1919–20. The gross revenue derived by the Central Government from opium was £3,289,111 in 1918–19, £3,037,480 in 1919–20, and is estimated at £2,415,466 in 1920–21.

ROYAL VICTORIA HOSPITAL, BELFAST.—The annual meeting of this institution was held in the central hall of the King Edward VII. Memorial Building on March 30th, the Lord Mayor of Belfast, Sir William Coates, presiding. The annual report showed that the number of cases treated had increased during the year, and that all departments were pressed for accommodation. The hospital had acquired from the Belfast Corporation an addition of six acres of ground and a portion of the former asylum buildings. The dental department had been assigned new premises, and four additional dentists had been added to the staff. The work of the radiological and electro-therapeutic department had been reorganised, and an additional radiologist appointed; it had been found necessary to increase the number of days of attendance in the ophthalmic department. The number of resident medical officers had been increased. The number of intern patients treated during the year was 4256 and of extern patients 27,629. The number of students in attendance upon clinical instruction in the hospital was 328 in the winter session and 279 in the summer session. The financial report showed that the receipts during the year amounted to £48,309 4*s.* 7*d.* and the disbursements to £48,277 8*s.* 3*d.* The deficit on the previous year of £6830 19*s.* 11*d.* had been practically wiped out by some generous donations. There was a drop in numerous expenses, but a considerable increase in nursing salaries and other salaries and wages. Working-class contributions to the hospital had risen from £5076 in 1915 to £19,248 in 1921, and were a principal source of revenue.

Medical News.

UNIVERSITY OF LONDON: LONDON HOSPITAL MEDICAL COLLEGE.—A course of 14 lectures on Psycho-Neuroses will be given by Dr. Millais Culpin in the clinical theatre of the London Hospital, at 5.15 P.M., on Tuesdays and Fridays, beginning May 2nd and ending June 16th. Headings of the lectures include Instinct and Emotion—Dissociation—the Unconscious—Suggestion—Conflict and Repression—Symbolism: Displacement of Affect—Dreams—Association Methods—ending with a General Review of Opinions. The fee for the course is 1 guinea.

INDIAN MEDICAL SERVICE DINNER FUND.—The annual dinner of the Indian Medical Service will be held at the Trocadero Restaurant on Wednesday, June 14th, at 7.45 P.M., Lieut.-Colonel J. Anderson, C.I.E., in the chair. Tickets and all particulars may be obtained from the joint hon. secretary, Colonel J. J. Pratt, I.M.S. (ret.), 63, Addison-road, London, W. 14.

WEST KENT MEDICO-CHIRURGICAL SOCIETY.—A meeting will be held in the board room of the Miller General Hospital, Greenwich, to-day (Friday), April 21st, at 8.45 P.M., when Mr. C. J. S. Thompson, M.B.E., curator of the Wellcome Historical Museum, will read a paper on Parturition Chairs, their History and Use, illustrated by lantern slides.

ASSURANCE MEDICAL SOCIETY.—A meeting will be held at the Medical Society of London, 11, Chandos-street, W., on May 10th, at 5.30 P.M., when Mr. W. McAdam Eccles will introduce the subject of Further Experiences of War Wounds in General in Relation to Life Assurance, and Prof. G. E. Gask the subject of War Wounds of the Chest and their Late Prognosis in Relation to Life Assurance.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—The programme of lectures arranged for the summer term is as follows:—

Monday, May 1st: Sir Humphry Rolleston, Recent Physiology of the Liver and its Application in Practice. Tuesday, 9th: Sir W. Arbuthnot Lane, Fractures. Tuesday, 16th: Sir Thomas Horder, the Clinical Significance of Hæmoptysis. Wednesday, 24th: Sir StClair Thomson, the Surgical Anatomy of the Nose and Accessory Sinuses—Lantern Demonstration. Tuesday, June 13th: Sir William Hale-White, the Clinical Symptoms of Coli Infection of the Urine. Monday, 19th: Prof. H. MacLean, Recent Work on Albuminuria and Glycosuria. Wednesday, July 12th: Prof. A. H. Todd, Surgery in Rheumatoid Arthritis. Wednesday, 19th: Mr. Victor Bonney, Myomectomy as Opposed to Hysterectomy.

The lectures will be delivered at 5 P.M. in the West lecture hall of the Royal Society of Medicine and are open to all members of the medical profession. Copies of the syllabus of the two weeks' special course in General Medicine from May 1st to 13th will be forwarded on application to the Secretary to the Fellowship of Medicine at 1, Wimpole-street, London, W. 1. A course of six lecture-demonstrations on Gastro-intestinal Affections in Children will be given at the "Children's Clinic," Western General Dispensary, from May 15th to June 1st; the syllabus will be available shortly.

EUROPEAN ANTI-EPIDEMIC CONFERENCE.—The resolutions are now available of the Conference held in Warsaw, from March 20th to 28th, which was convened by the Polish Government with the approval of the League of Nations Council and the help of its secretariat and health organisation. The 27 powers attending the Conference were Austria, Belgium, Bulgaria, Czecho-Slovakia, Denmark, Esthonia, Finland, France, Germany, Great Britain, Greece, Holland, Hungary, Italy, Japan, Jugo-Slavia, Latvia, Lithuania, Norway, Poland, Roumania, Soviet Russia, Soviet Ukraine, Spain, Sweden, Switzerland, and Turkey. The Free City of Danzig was also represented. The object of the conference was to draw up a detailed report on the epidemic situation in East Europe, and submit plans for an international campaign. These plans consist of (*a*) immediate measures for checking the spread of epidemics beyond the Russian frontiers, and (*b*) a scheme of aid to the Russian and Ukranian health services in an attack on the centres of infection. It was felt that purely defensive measures on the Russian frontier would merely prolong the problem indefinitely. Payment of the money for this campaign would be on a scale similar to that for payment of the League budget by members of the League. The Conference also resolved that execution of these measures should be entrusted to the League Health Organisation and Epidemics Commission, on which bodies all States taking part must be represented. A draft designed as a model for a series of sanitary convocations between the Central and Eastern European States concerned was also approved. The report and recommendations of the Conference are to be communicated to the Genoa Conference.

HONOUR FOR A MEDICAL MAN.—The honorary freedom of the Borough of Oldham has been conferred on Dr. Thomas Fawsitt in recognition of his services to the town, and more especially for his long and useful connexion with the Oldham Royal Infirmary since its inception half a century ago. The casket in which the roll was presented was ornamented with a view, in enamel, of the Oldham Royal Infirmary, of which Dr. Fawsitt was the first doctor to be elected president. Dr. Fawsitt was also presented with his portrait in oils.

ST. MARYLEBONE GENERAL DISPENSARY: *Post-Graduate Course on Infant and Child Welfare.*—A course of 12 lectures on the Management and Feeding of Infants and Young Children will be given by Dr. Eric Pritchard to qualified practitioners on Mondays and Thursdays, commencing Monday, May 1st, at the St. Marylebone General Dispensary, at 6 P.M. Students taking this course will be entitled to attend the infant consultations held by Dr. Pritchard on Tuesdays at 11 A.M. and Thursdays at 3 P.M. at the dispensary. Opportunities will be afforded of visiting the Nursery Training School at 1, Wellgarth-road, Golders Green, and of seeing there the same methods employed in dealing with resident infants. Tickets for the course, 2 guineas. Further information from the secretary, 77, Welbeck-street, London, W. 1.

HARROGATE MEDICAL SOCIETY.—The final meeting for the session was held on March 23rd, when Dr. G. L. Kerr Pringle and Dr. S. Miller communicated a joint paper on a group investigation of 100 cases of arthritis with special reference to the application of Glucose Tolerance Tests in such conditions, the communication including a digest of original work carried out at the Royal Bath Hospital, Harrogate, during the year 1921. Dr. Pringle quoted a series of cases of arthritis in which the glucose tolerance reaction afforded guidance in treatment and assistance in prognosis; he outlined a scheme of classification of arthritis which had been proposed by the Mineral Waters Hospitals of Harrogate and other British spas. Dr. Miller sketched the technique of the glucose tolerance test and emphasised its importance as a guide to the existence of septic foci. Discussion followed.

PRESENTATION TO SIR HALLIDAY CROOM.—A memorable evening was spent by some 25 former assistants and resident medical officers to Emeritus Professor Sir Halliday Croom on April 7th, when they entertained their chief to dinner at the North British Station Hotel, Edinburgh. To mark the occasion of his retirement last year from the Chair of Midwifery in the University of Edinburgh and the completion of 50 years of teaching in the Edinburgh Medical School, a silver salver with a suitable inscription and the engraved autograph signatures of 50 former assistants and residents was presented to Sir Halliday Croom by the chairman, Dr. Haig Ferguson, who also proposed his health. The toast was supported by Dr. George Mackie and Dr. George Gibson. Sir Halliday Croom replied in a speech full of interesting reminiscences of his career as a teacher of midwifery and gynæcology, delivered in happy vein. Amongst those present were Dr. Godfrey (Scarborough), Dr. Hale Puckle, Dr. Scott Macgregor (Glasgow), Dr. Duncan Main (Manchuria), Dr. C. W. Donald (Carlisle), Dr. J. Aarons (London), Dr. Lamond Lackie, Dr. W. Fordyce, and Dr. R. W. Johnstone (Edinburgh); whilst letters and telegrams of apology and regret were received from such distant parts as Montreal, Egypt, and New Zealand.

ROYAL MEDICAL BENEVOLENT FUND.—The annual meeting of this Fund was held at the rooms of the Medical Society of London on April 4th, with Sir Charters Symonds, hon. treasurer, in the chair. Dr. Newton Pitt, hon. secretary, presented the annual report, which stated that the income in the grant department showed an increase of £500 over the previous year, and this enabled the Committee to increase the amount of the grants in some of the more urgent cases. Many more really deserve an increase, but this is not possible. If each subscriber would make a point of asking one medical friend to become a contributor this would help the Committee greatly. At present only 7 per cent. of the profession subscribe. The total received during the year in subscriptions and donations was £3856. The amount distributed to 241 cases was £3372. In the annuity department the income amounted to £4122. There are 178 annuitants, 50 of which are of the value of £26 per annum; 100 of £20 per annum, and the remainder varying amounts. The War Emergency Fund has expended since its inception upwards of £20,000, and at the present time are educating over 40 sons and daughters of medical men at public and other schools. The total amount received for this Fund was £35,620. Cordial votes of thanks were passed to the officers, to the Editors of *The Lancet*, *British Medical Journal*, and the hon. auditors. Sir Thomas Barlow, Bart., was re-elected president, Sir Charters J. Symonds, hon. treasurer, and Dr. Newton Pitt, hon. secretary.

HUNTERIAN SOCIETY.—The annual general meeting of the Hunterian Society will be held at the Sion College, the Embankment, E.C. 1, on Wednesday, April 26th, at 9 P.M.

NEW MEDICAL OFFICER OF HEALTH OF SALFORD.—The Salford Health Committee have unanimously recommended the appointment of Dr. H. Osborne as medical officer of health in succession to Dr. C. H. Tattersall, who retires at the end of this month after holding the position for a quarter of a century. Dr. Osborne was appointed as an assistant to Dr. Tattersall 14 years ago, and for the last six years he has been deputy medical officer of health for the borough.

GIFT OF RADIUM DEPARTMENT TO MANCHESTER ROYAL INFIRMARY.—Mr. Robert McDougall, of Manchester, has intimated to the managers of the Royal Infirmary, Manchester, his desire to defray the entire cost (£5000) of equipping a radiological department in the infirmary as a memorial to his father. It is expected that the department will be ready for use three months hence.

MANCHESTER DENTAL HOSPITAL.—At the annual meeting it was stated that this hospital is in urgent need of funds. The year's accounts show an adverse balance of £2706 on the building fund and £3126 on the general account. Apart from the clinical work and the training afforded for the dental students attending the University, its work for the public is steadily increasing. There were 29,036 patients treated during the year, an increase of 6000 over the previous year.

ORTHOPÆDIC SURGERY AT LEEDS.—After much consideration and full discussion it has been decided to institute a department of orthopædic surgery at the General Infirmary. The extent and the limits of the work comprised in the term "orthopædic" might give rise to endless, and in some respects to profitless, discussion, but they are generally understood. The surgical staff of the infirmary, apart from that which is attached to the special departments, has, for a good many years, consisted of four surgeons and four assistant surgeons. It has been decided to increase the number of the surgical staff to nine, and one of these shall be in charge of the new department. Mr. S. W. Daw, who has served the infirmary as assistant surgeon since 1913, has been appointed to the position, and will receive the cordial support and coöperation of all his colleagues. In the first instance two residents will be appointed: a resident orthopædic officer, who will receive a salary of £150 per annum and will rank with the other senior residents, and an orthopædic house surgeon. The out-patient department will, it is thought, develop rapidly. At first it will be open but one day a week; urgent cases, of course, will be dealt with at any time. The non-urgent cases for operation will be attended to on Saturday mornings at 10 o'clock. Most cases of fracture will be transferred to the department from the casualty department, and both in the case of in-patients and out-patients there will be a great segregation of such cases. This, it is believed, will be conducive both to good treatment and to good teaching. Apart from those beds for the treatment of fractures, it has been decided to allocate to the department eight male and four female beds in addition to a certain number of cots, and the department will share with the other departments of the infirmary the beds and cots at the semi-convalescent hospitals at Cookridge. The relationship of the department to the students has been carefully taken into account. All students will have appointments which shall ensure that they get good opportunity of acquiring a sound and practical acquaintance with the efficient treatment of recent fractures and with the more common operations involved by the class of case which will be treated. To those students who are desirous of extending their knowledge and experience, and to those recently qualified men who are desirous of specialising in orthopædic work, full facilities will be afforded. The surgery of Leeds has always included a large amount of orthopædic work, and it will be remembered that during the last few years of the war the Second Northern General Hospital developed, under the guidance of Colonel Littlewood, into a great orthopædic centre, and that orthopædic work is still being carried on in the hutments at Beckett's Park under the Ministry of Pensions, where there still remain some 500 patients. The scope of the work as above outlined will, it is thought, prove to be the nucleus of bigger things. Arrangements are already being made for linking up the massage and electrotherapeutic work of the infirmary with the new department; a school of massage will soon be started, and it is hoped that the treatment of the cases will be carried on to the attainment of the best possible results by the establishment of curative workshops. The development of the department will be watched by everyone who is interested in hospital management and by those who are concerned in the welfare of the students.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Monday, April 24th.

ODONTOLOGY: at 8 P.M.
Casual Communication:
Mr. J. Howard Mummery: Notes on Dental Disease in Ancient Egypt, demonstrating some Photographs forwarded by the late Sir Armand Ruffer.
Papers:
Mr. Evelyn Sprawson: (1) A Case of Multiple Follicular Odontomes (Dentigerous Cysts) in the Mandible, and some remarks as to the Pathology of such Cysts. (2) On the Significance of the Extra Cusp commonly found on the Antero-Internal Aspect of the Maxillary First Permanent Molar in Man.

Tuesday, April 25th.

MEDICINE: at 5 P.M.
Clinical Meeting at the Middlesex Hospital, W. 1.

Thursday, April 27th.

UROLOGY: at 8.30 P.M.
Discussion: On "Tests of Renal Function," to be re-opened by Mr. Jocelyn Swan. Followed by Sir John Thomson Walker, Dr. Geoffrey Evans, Dr. G. A. Harrison, Mr. S. G. Macdonald, Dr. J. R. Marrack, Mr. G. E. Neligan, Mr. Kenneth M. Walker, Mr. R. Ogier Ward.

Friday, April 28th.

STUDY OF DISEASE IN CHILDREN: at 5 P.M. (Cases at 4.30 P.M.)
Cases will be shown.
Presidential Address by Sir Robert Jones.
EPIDEMIOLOGY: at 8 P.M.
Paper:
Dr. F. Dittmar: Outbreaks of Enteric Fever Associated with Carrier Cases.

Saturday, April 29th.

OTOLOGY:
Meeting at Leicester at 12 o'clock at Wyvern Hotel. 2 P.M., Meeting at Infirmary: Cases.

ROYAL INSTITUTION OF GREAT BRITAIN, Albemarle-street, W. 1.
TUESDAY, April 25th.—3 P.M., Sir Arthur Keith: Anthropological Problems of the British Empire: Racial Problems of Africa.
THURSDAY.—3 P.M., Mr. E. H. Barton, D.Sc.: The Resonance Theory of Audition.
FRIDAY.—9 P.M., Mr. A. Harden, D.Sc.: Vitamin Problems.

HARVEIAN SOCIETY OF LONDON, Town Hall, Paddington Green, W. 2.
THURSDAY, April 27th.—Discussion on Influenza.
Speakers: Dr. Sidney Phillips, Sir Humphry Rolleston, Sir Thomas Horder, Dr. R. A. Young, Dr. Thoresby Jones, Dr. Beaumont, and Dr. Freeman.

LONDON DERMATOLOGICAL SOCIETY, 49, Leicester-square, W.C. 2.
TUESDAY, April 25th.—4.30 P.M., Pathological Specimens, Cases sent for Consultation, and Clinical Cases. 5.15 P.M., Dr. R. Prosser White: Syphilis and Marriage.
Fellows' Monthly Dinner: Cavour Restaurant, Leicester-square, at 7 P.M. Tickets 6*s.* 6*d.* each. Fellows intending to be present kindly notify Dr. Mitchell, 33 Weymouth-street, W., at or before the Society's meeting.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
MONDAY, April 24th.—2 P.M., Dr. Grainger Stewart: Wards.
TUESDAY.—2 P.M., Dr. Scott Pinchin: Medical Out-patients.
WEDNESDAY.—2 P.M., Dr. Morton: X ray Department.
THURSDAY.—2 P.M., Mr. MacDonald: Surgical Out-patients.
FRIDAY.—2.15 P.M., Mr. Addison: Operations.
SATURDAY.—2 P.M., Mr. Simmonds: Surgical Out-patients.

BRITISH MEDICAL ASSOCIATION (CHESTERFIELD BRANCH) POST-GRADUATE COURSES.
FRIDAY, April 28th.—(At Chesterfield Royal Hospital Board Room) 2.30 P.M., Mr. Mouat: Intestinal Obstruction. 3.15 P.M., Prof. Leathes: Practical Methods of Testing Renal Efficiency.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE CLINIC.
TUESDAY, April 25th.—1.30 P.M., Dr. W. E. Fothergill: Scope of Modern Gynæcological Surgery.

CHARTERED SOCIETY OF MASSAGE AND MEDICAL GYMNASTICS.—The annual conference of this Society will be held at the Salford Royal Hospital on Saturday, April 29th, when a lecture and demonstration on Tendon Transplantation will be given by Mr. Robert Ollerenshaw at 10.30 A.M.

Appointments.

HUTCHINSON, R. C., M.D., Ch.B. Manch., D.P.H., has been appointed Medical Superintendent of the Royal National Hospital for Consumption, Ventnor.

MACDONALD, D. C., M.B., Ch.B. Glasg., Certifying Surgeon under the Factory and Workshop Acts for Manchester, West Central.

POLLOCK, W. B. I., F.R.F.P.S.G., Surgeon to the Glasgow Eye Infirmary.

SMELLIE, J. M., M.D., Ch.B. Edin., Physician to Out-patients at Birmingham and Midland Free Hospital for Sick Children.

Vacancies.

For further information refer to the advertisement columns.

Ashton-under-Lyne District Infirmary.—H.S. £150.

Birmingham and Midland Hospital for Diseases of Nervous System, &c.—Three Physicians. £600 and £450.

Birmingham General Hospital.—Two H.S.'s. Each £100.

Birmingham Cripples' Union, Open Air Hospital.—Res. S. £250.

Boolle Borough Hospital.—Jun. H.S. £150.

Bournemouth, Royal Victoria and W. Hants Hosp.—Hon. Asst. S.

Bradford City Technical College.—Asst. Lect. in Biology. £439.

Bristol Royal Hospital for Sick Children, &c.—Hon. P.

Burnley County Borough.—M.O. for Ven. Dis. £850.

Canning Town Women's Settlement Hospital, Balaam-street, Plaistow.—Res. M.O. £150.

Carlisle, Cumberland Infirmary.—Res. M.O. £175.

City of London Hospital for Diseases of Chest.—H.P. £125.

East London Hospital for Children, Shadwell.—Radiologist. £100.

Elizabeth Garrett Anderson Hospital, Euston-road.—Ophth. S.

Fulbourn, nr. Cambridge, County Mental Hosp.—Asst. M.O. £220.

Guildford, Royal Surrey County Hospital.—H.S. £150.

Hampstead, New End Hospital.—Asst. M.O. £150.

Harefield, Middlesex County Tuberculosis Sanatorium.—Second Asst. Res. M.O. £400.

Harrogate Infirmary.—H.S. £150.

Hospital for Epilepsy and Paralysis, Maida Vale.—Res. M.O. £150.

Hospital for Sick Children, Great Ormond-street, W.C.—Med. Reg. and Path. £300. H.S. £100.

Hull Royal Infirmary.—Sen. H.S. £200.

Kensington and Fulham Hospital, Earl's Court.—Res. M.O. £200.

King's College Hosp., Denmark Hill.—Jun. Orthop. S. and Jun. S.

Leamington Spa, Warneford, &c., General Hosp.—Res. H.P. £150.

Leeds General Infirmary.—Res. Orthopædic O. £150.

Liverpool, Royal Southern Hospital.—Hon. Asst. S.

London Hospital, E.—Asst. Anæsthetist.

London Temperance Hosp., Hampstead-rd.—Med. Reg. 40 gns.

Maidstone, West Kent General Hospital.—H.S. £220.

Manchester, Northern Hospital for Women and Children.—Hon. S.

Manchester Royal Infirmary.—H.S. £100.

Manchester, St. Mary's Hospitals for Women and Children.—H.S. £100.

Middlesex Hospital, W.—Ophth. S.

Queen's Hospital for Children, Hackney-road.—Two Cas. H.S.'s. £100 each.

Royal Northern Hospital, Holloway.—Two H.S.'s and one H.P. Each £150.

Royal Waterloo Hospital for Children, &c., Waterloo-road, S.E.—H.P. £100.

Sheffield Royal Hospital.—Asst. Cas. O. £150.

Stockport General Infirmary.—Asst. H.S. £175.

Stoke-on-Trent, North Staffordshire Infirmary.—Hon. Asst. Ophthal. S.

Throat Hospital, Golden-square, W.—Hon. Surg. Reg.

University College Hospital, Gower-street, W.C.—Two Hon. Anæsthetists.

Wakefield, Middleton-in-Wharfedale Sanatorium.—Asst. M.O. £500.

Warrington, Lancashire Co. Asylum, Winwick.—Asst. M.O. £300.

West London Hospital, Hammersmith-road.—Non-Res. Cas. O. £5 5s. per week. Hon. Med. Radiographer.

Wolverhampton, Borough of.—Asst. M.O.H. £500.

Wolverhampton, &c., General Hospital.—H.S. £200.

The Chief Inspector of Factories, Home Office, S.W., gives notice of a vacancy for a Certifying Surgeon under the Factory and Workshop Acts at Crondall.

Births, Marriages, and Deaths.

BIRTHS.

DAVIES.—On April 17th, at 57, Gordon Mansions, W.C. 1, the wife of Trevor B. Davies, M.D., F.R.C.S., of a daughter.

MAYBURY.—On April 3rd, at Highland House, Mile End, Portsmouth, the wife of A. V. Maybury, M.B., of a daughter.

PHILLIPPS.—On April 12th, at Ashley-gardens, S.W., the wife of F. A. Phillipps, M.R.C.S., L.R.C.P., of a daughter.

MARRIAGES.

RICHARDSON—ROSS.—On April 7th, at Seville, Captain D. T. Richardson, M.C., R.A.M.C., son of the late Dr. Richardson and of Mrs. Richardson, Tigh-na-Mara, North Berwick, to Jean, daughter of Dr. and Mrs. Ross, Rio Tinto, and granddaughter of the late Colonel Ross, Leicester Regiment.

DEATHS.

BLIGH.—On April 13th, at Liverpool, Alexander Murray Bligh, M.R.C.S., aged 88 years.

MERRY.—On April 13th, at Exmouth, suddenly, of pneumonia, Dr. William Joseph Collins Merry, O.B.E., M.A., M.D., of Eastbourne.

Notes, Short Comments, and Answers to Correspondents.

INSTITUTIONAL FEEDING.

AT the Caxton Hall, Westminster, on April 7th, under the auspices of the Food Education Society, Miss A. D. Muncaster delivered a lecture on Feeding in Institutions, with Special Reference to School Diet. Sir William Collins was in the chair, and was supported by Dr. Harry Campbell, Dr. R. O. Moon, and Dr. M. J. Rowlands.

Miss Muncaster alluded to the recognised importance of diet amongst all the great nations of the world, and remarked that, as a nation, the English have taken hitherto little or no interest in diet. Great books on the subject have been read with less concern than the novel of the moment, and any earnestness in food reform has earned for the reformer the name of faddist. The feeding of Derby winners and prize cattle for the Islington Show has been studied to a nicety by agriculturists, and colliers have fed their whippets on beef-steak, but except in training for sport the nation is uninterested in the matter of diet. The needed rude awakening came with the war. We were threatened with starvation: we had to feed a gigantic army in all sorts of climates; we found ourselves unprepared for shortage, with an inelastic diet system for sick men, and cooking inadequate and unimaginative.

Hospital Diet.

The war brought hospitals into the lime-light and severely tested their methods of commissariat.

Until the food shortage became acute, very little, if any, inquiry was made as to whether the diet was adequate, or suitable, or superfluous, or as to whether any waste occurred in the cooking. In pukka military hospitals half a chicken was the allowance for a patient on chicken diet; the raw chicken was cut in half and cooked thus. Custard diets were made from patent custard powders whose composition proved to be chiefly starch, the yellow colour being imparted by mixture with some vegetable dye. In 1918, an Army Council instruction laid down two scales of diet, according to caloric values: (*a*) 2700 calories, and (*b*) 3250 calories. With the low standard of cooking which obtained in many hospitals the loss in cooking must have been from 50 to 75 per cent. of caloric value. The monotony of the food was pathetically unnecessary, while the cleanliness of the kitchens and store-rooms far from satisfactory. And now the feeding in hospitals is still a matter of compelling interest; we have to face a desperate economic condition which threatens to paralyse the great and beneficent work of the hospitals. It would be well if a scrutiny of the feeding arrangements could reveal economies in labour, in fuel, and in wastage of food through improper storage and bad cooking; administration is needed through a more highly trained staff and so are hygienically constructed kitchens. The cost of a patient in hospital is determined by the length of his stay. The length of stay is determined by the rate of his convalescence, and the convalescence, or body-building and tissue-repairing, is determined very largely by diet. The lecturer alluded to the appointment of the committee to consider the dietaries in mental hospitals, and also to the recommendation of the recent Oxford and Cambridge Commission to appoint an expert caterer, and to control college supplies.

School Diet.

Turning to the trials of the war in relation to the commissariat of schools, Miss Muncaster described the recent ebullition of feeling as part of a great renaissance in the matter of food, and recommended: (1) Establishment of a recognised standard of diet which should be accepted alike by parents and headmasters (Miss Muncaster quoted Dr. C. Dukes, who says that the total supply required by adolescents is largely in excess of that called for by adults, and that girls need as much as boys); (2) securing, in a plentiful diet, the proper proportions of necessary materials (body-building and tissue-repairing proteins, a large proportion of fats, sufficient raw salads and fruits, and starch foods, including a proper amount of hard food, such as crusts and bread rolls, to secure correct mastication); (3) variety of well-cooked, well-served diet, recognising the idiosyncrasies of the individual and the requirements of latitude and of weather.

With regard to the administration of school diet, Miss Muncaster quoted Charles Lamb, who says:—

"I have often considered it among the felicities of the constitution of this school that the duties of steward and schoolmaster are kept distinct, the strict business of education alone devolving upon the latter, while the former has the charge of all things out of school, the control of provisions and the regulation of meals . . . . A still greater advantage . . . . is to be found in the settled salaries of the masters, rendering them

totally free of obligation to any individual pupil or his parents. Boys *will* see and consider these things and this never fails in its effect at schools where they view the master every day in the light of a caterer."

Miss Muncaster suggested that schools could be immediately and definitely helped in some of the following ways: 1. Extraneous advisory help from those who have expert knowledge and experience in these matters. 2. Comparative returns from different schools. 3. Purchase of supplies at wholesale prices. 4. Constant supervision of the quality of supplies, the quality of the cooking, and the quality of service. 5. Acceptability of the food served and a strict supervision of all uneaten food and of all waste. 6. Revision of kitchen arrangements and equipment, which would probably secure enormous economies. 7. More highly trained personnel. 8. Messing clubs, which should consist of the headmaster, matron, medical officer, caterer, cook, the head senior boy, the head junior boy, &c., who would receive all complaints and discuss the appreciation or dislike of the food and receive and make suggestions.

A more highly trained personnel, Miss Muncaster suggested, might be helped by a course of short, intensive training on the lines of extension lectures, adding that there is a most intelligent and comprehensive system of institutional housekeeping contained in the duties of the quartermaster as laid down in the standing orders of the R.A.M.C. The tuck shop and the tuck box, the lecturer said, are in themselves a standing criticism of the inadequacy and monotony of school diet; when the diet is entirely adequate and secures more variety, these two adjuncts will assume their proper proportions. In the meantime, the wisdom of the parent is put to test by what fills the tuck box, and the wisdom of the schoolmaster should determine what fills the tuck shop—which shop should always belong to the school. The lecturer also emphasised the equal importance of a plentiful and varied diet in all convalescent homes and institutions to which delicate or invalid children are sent, concluding by pointing out that feeding in institutions and schools must be regarded as an industrial concern, and carried on along up-to-date business lines.

GERMAN X RAY APPARATUS.

To the Editor of THE LANCET.

SIR,—In your issue of April 1st (p. 674) "British Manufacturer No. 3" has explained my letter so convincingly that nothing further remains for me to say, except that I hope that foreign competition will not be allowed to dominate the situation for want of home enterprise and efficiency.

I am, Sir, yours faithfully,

Eastbourne, April 12th, 1922. A. G. SHERA, M.D.

OVA OF *TRICOCEPHALUS DISPAR*.

To the Editor of THE LANCET.

SIR,—In searching for the ova of the *Tricocephalus dispar*, the easiest way is to break up and shake up with water the suspected fæcal matter; if this is liquid, there would be less breaking and shaking. Then use a centrifugalising machine for the solution and examine the deposit in the tubes with a low power of the microscope. This plan is superior to searching simple smears of fæcal matter; of course, there will be great collection of fragmentary objects, but the ova are easily distinguished in the crowd.

I wish I knew how to succeed in finding the worm itself; perhaps someone may give me a hint.

I am, Sir, yours faithfully,

Carlisle, April 10th, 1922. H. A. LEDIARD.

RELIANCE RUBBER GOODS.

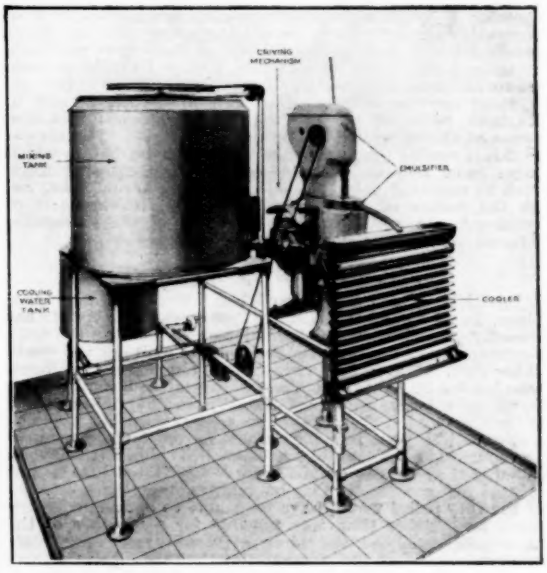
WE have received from the Reliance Rubber Company, Limited, 212, 213, Upper Thames-street, London, E.C. 4, specimens of their rubber gloves and sponges, manufactured for the use of surgeons and those engaged in certain kinds of hospital administration—for example, those assisting in post-mortem examinations. Three different pairs of gloves have been examined, and of all of them we can say that the claims for careful and good manufacture are quite justified, and the trouble that has been expended has been repaid by the quality of the result. All the gloves are seamless, flexible, and highly finished, and we are willing to believe that they will also be durable if they receive proper treatment; but the user of rubber goods of any kind must remember that grease, oil, and acid are always injurious to rubber, and that of all rubber articles perhaps gloves in particular require most to be dried and stored at equable temperature when not in use. Of the three pairs of gloves examined one is pebble-marked, producing a surface which, though smooth, is not slippery, one pair is quite plain, and the third pair, of much thicker substance, is for household employment. These last-mentioned gloves would obviously be of great use in hospital wards, though they are not intended for use by operating surgeons. The firm also send an example of their rubber sponges, which is so soft and close in substance that it should be durable, while it is certainly comfortable to employ.

The price, retail, to hospitals and surgeons for the pebble-marked gloves is 45*s.* per dozen pairs, and for the smooth glove 40*s.* per dozen pairs.

THE RECONSTITUTION OF DRIED MILK.

THE fat in cows' milk is in the form of an emulsion, the droplets varying widely in diameter from about 0·002 mm. to 0·028 mm., with an average of 0·008 mm., being prevented from coalescing by an envelope of caseinogen. In the process of drying milk on the hot cylinder by the Just-Hatmaker process a certain proportion of these envelopes are broken, owing to the coagulation of the caseinogen, and from the milk when reconstituted a layer of butter-fat separates on the top. In good brands of milk there is nothing unpleasant about this layer of butter-fat. It is not rancid, and it has no drawback in the making of puddings, custards, and the like, but for the artificial feeding of infants it has the inconvenience that the container requires agitating during feeding.

The Glaxo Company demonstrated to us recently an apparatus termed an emulsifier, by which dried milk can be so reconstituted as to avoid this separation of butter-fat, and this without the addition of anything whatever other than water. The illustration shows the main features of this



apparatus. Glaxo milk-powder and water are mixed in a jacketed receiver, which is then slowly heated to 140° F., the contents being agitated meanwhile by a revolving paddle. When the temperature reaches 140° F., the milk passes on and is drawn up the inside of a hollow cylinder revolving at several thousand revolutions a minute, in which, by its own centrifugal force, the fat is broken up again into very minute globules. From the hollow cylinder the warm milk passes over a refrigerator, and is collected into vessels, when it is at once ready for use. It is at first curiously white, owing to admixture with minute air-bubbles, which soon rise to the surface, leaving the fluid perfectly homogeneous, and remaining homogeneous for hours. Under the microscope a drop of this reconstituted milk shows an average size of fat globule appreciably less than that of fresh cows' milk, the diameter of the globule varying between 0·002 mm. and 0·02 mm., the average being about 0·006 mm. The reconstituted milk is pleasant to taste, and does not tend to separate a cream, except on long standing. Thus by purely physical means the Glaxo Research Laboratories have succeeded in reconstituting dried milk in a form which meets certain familiar objections, especially the tendency to separate in the feeding-bottle.

The apparatus is intended for use in institutions where some gallons of milk are used daily. One is on trial at University College Hospital, where the daily consumption of raw milk amounts to some 90 gallons. Another has been installed at King's College for Women, Campden Hill. The method has no application as yet to the personal and domestic use of dried milk-powder.

TUBERCULOSIS AND THE MILK-SUPPLY.

Dr. M. J. Rowlands, in a communication to THE LANCET, states his conviction that the present-day increase of tuberculous disease is due to the almost universal forcing up of the milk-supply by the giving of concentrated foods from which vitamins are absent. He has carried out experiments extending over seven years on pedigree pigs, of which he breeds some 2000 annually. The prevalence of tubercle amongst pigs, as well as amongst cattle, is well known to all stock-breeders who have any idea of disease. Up to two years ago Dr. Rowlands, like all stock-breeders, constantly found animals suffering from pleurisy with adhesions, disease of bones, abscess in the submaxillary glands, &c.; on one occasion he purchased 12 young sows from a well-known breeder, only to find that every one of the 12 was suffering from tuberculosis, and had to be slaughtered and buried. During the last seven years he has not confined the pigs to sties; they are all bred and reared in woodlands, under the most hygienic conditions possible, yet until two years ago many animals periodically showed marked post-mortem signs of tuberculosis. Dr. Rowlands observes that the interesting point about his investigation was that the disease was most marked during late winter and very early spring, so he came to the conclusion that there was probably a deficiency in their diet during this period. He decided to supply a material rich both in the fat-soluble vitamin A and the water-soluble vitamin B. The results have been almost miraculous; within the last eight weeks he has carefully examined, post mortem, 160 carcasses from his farm, none showing a single sign of tuberculous infection either of lymphatic glands, pleura, or mediastinum. Dr. Rowlands attributes this fact to the supply of these two necessary vitamins; the same, he contends, applies to milking cows, whose diet must be considered rather than their surroundings. Visiting one the most modern and up-to-date estates in England, he found recently that all the animals that won prizes at shows reacted to the tuberculin test. The answer to this is readily found, when you consider the diet on which these show animals are fed—namely, concentrated foods such as cocoanut cake, linseed cake, palm kernel cake, &c. As the results of his investigations, Dr. Rowlands is of opinion that none of these contain any of the fat-soluble vitamin A, being made entirely from vegetable oils.

AMBULANCES IN LONDON.

THE delay which may occur when a street accident takes place, in conveying the injured person to a hospital, has recently excited an unusual amount of comment in the daily newspapers. Attention has been called to it by the death of the Rev. W. A. C. Craig, vicar of St. Sepulchre's, Holborn, who lay for 20 minutes in the roadway after being knocked down by a lorry, and since then by another inquest held in the City by Dr. F. J. Waldo on a seven-year-old boy who was stated to have remained where he fell for a quarter of an hour before an ambulance reached him. It may be noted that in the case of Mr. Craig it was stated that he was injured just outside the City boundaries, and that a member of the City police would have been able to obtain an ambulance far quicker than was possible for a member of the metropolitan police; the latter presumably not being aware of the resources at the command of the City force. In any case the City is better provided with ambulances than is the county of London in view of the limited area of the former, and in the City there are ambulance call-boxes in the street for summoning them. The London County Council maintain only six ambulances, and they are kept fully busy by calls, according to a representative of the Council, who was questioned by Dr. Waldo.

The matter is one which intimately concerns Londoners, and the public in general must realise, almost as clearly as do the staffs of the hospitals to which accidents are brought, how important it is that the injured should be treated with the least delay. If any improvement is desired by the public in a situation which is distinctly unsatisfactory, the remedy can only be supplied by the public itself. The London County Council, which represents it, can be urged and authorised to provide more ambulances, or the public can raise funds voluntarily for the purpose, with such aid in the way of accommodation as the Council or other local bodies or private individuals may be able to give. In either case it is a question of money for purchase and maintenance, and of organisation framed to meet the number of ambulances to be disposed of. The hospitals are struggling to keep open the wards in which cases brought to them may be treated, and they, at any rate, have no funds to spend upon bringing in the patients for whom they can only find room with difficulty. It has been stated that since the inquests referred to above the London County Council is giving the whole matter serious consideration, and that fire stations may become centres for the garaging and despatch of ambulances. It is to be hoped that any intention so formed will be carried out without delay.

GOLD COAST HEALTH REPORT.

Northern Territories, Gold Coast.—Mr. Arthur J. Philbrick, LL.B., Chief Commissioner, in his report for 1920, writes: The computed area of the country is 31,100 square miles, and the population 10 years ago was reckoned at 361,806, or an average of 11·6 to the mile. It is thought that in spite of cerebro-spinal fever and influenza the population will now be found to have considerably increased. It is most unevenly distributed, the districts in the north being thickly inhabited, while the Southern Province is only sparsely populated. A very serious attack of cerebro-spinal fever occurred during the year. This disease is now held to be endemic, and appears annually in the dry season. It started this year (1920) in the Lorha district at the extreme north-west during January, and spread rapidly southwards, and even entered Ashanti, supposedly for the first time. Every effort was made with the limited staff available to combat its spread, but it continued until the rains. The deaths numbered about 3000. A close study of it was made on the spot by Dr. Dalziel, the senior sanitary officer, and I would refer those interested to his careful and valuable report published at Accra. European officials in the Protectorate numbered 36. There was one death from blackwater fever at Yeji and one was invalided from the same cause from Tamale; 18 individuals were on the sick list for a total of 181 days. The Provincial M.O. reports that, considering the very trying climate and the conditions of life, the health of officials during the year may be classed as good. Native officials numbered 54. There were no deaths and only 12 cases on the sick list. In addition there were four European ladies, three white Fathers, and one Syrian trader. The latter died of chronic alcoholism, but there was no sickness amongst the others. Medical officers were stationed at Tamale, Wa, and Gambaga, with dispensers or nurses at Tamale, Salaga, Gambaga, Zouaragu, and Wa. The Provincial M.O. reports that the Protectorate was understaffed with medical officers, and strongly recommends an increase of staff as early as possible. There are Government native hospitals at Tamale, Salaga, and Bole, Wa, Tumu, and Lorha, Gambaga, and Zouaragu; those at Tamale and Salaga are permanent buildings, the others being of adobe bricks with grass roofs. Owing to the lack of medical officers, very little advantage is taken of these institutions. The few natives that come in to be treated by the native dressers get tired if a marvellously rapid cure is not effected, and go back to their native medicines. The climate is singularly hot and trying and is very lowering to vitality and irritating to the nervous system.

THE IMPORT OF MILK.

A RETURN was made this week to Parliament by the Board of Trade stating figures for the import of milk, condensed and preserved, into England from various continental countries during the first quarter of the current year. No fresh milk was imported during this period, nor was any milk powder containing added sugar or other sweetening matter. Imported milk is divided up in the return into six categories, the first three non-dutiable, the remainder dutiable; the quantities are given in hundreds of cwt.: (1) milk cream, 1·7; (2) milk condensed, not sweetened, 47·4; (3) milk powder, not sweetened, 31·5; (4) milk preserved, other kinds not whole, 64·1; (5) milk condensed, sweetened, whole, 147·0; (6) milk condensed, sweetened, separated or skimmed 278·2. Of the several countries of origin the Netherlands figure the highest in categories 5 and 6; New Zealand in categories 3 and 4; and the U.S.A. in category 2. Denmark is the next largest contributor, then in descending order Australia, Norway, Canada, and Switzerland—the last-named still with more than 20,000 cwt. The total value of imported milk was over £2,300,000.

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